TEXTILE WORLD

KINK BOOK

VOLUME VIII

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TEXTILE WORLD
KINK BOOK—VOL. VIII

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by

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FOREWORD

It is always a great pleasure to present a new Kink Book to our friends who read TEXTILE WORLD. So many of these friends co-operate during the year in supplying material for the Questions and Answers Department of TEXTILE WORLD that we really consider the publication of these annual Kink Books to be a mutual undertaking.

For the information of new readers we might explain that for many years it has been the practise of the publishers of TEXTILE WORLD to compile what they consider the best technical questions and answers submitted by mill men during the preceding year and to publish this in handy book form. If your travels take you among the mills, you will find thousands of superintendents and overseers who have considerable collections of these annual Kink Books. Any practical mill man who has such a collection of Kink Books possesses a technical library on practical mill work which can scarcely be excelled. There are few problems in mill operation, production and management which have not been covered by these questions and answers.

The demand for Kink Books has been so large that we have had to place a price of $1.00 per copy for those who are not subscribers to TEXTILE WORLD. Every subscriber to TEXTILE WORLD is entitled to his choice of one Kink Book free with each year's subscription. Subscribers who wish to acquire additional Kink Books may purchase them at the special price of 75 cents per copy.

We take this occasion to acknowledge our indebtedness to the many contributors to TEXTILE WORLD, including manufacturers, superintedents, overseers and experts in mechanical and chemical lines. We also extend a hearty welcome to all those engaged in the textile industry who may wish to use the facilities of our organization for getting information on any problem whatsoever.

C. H.

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Rayon Destroyed in Bleaching

We had 90 lbs. of artificial silk half hose (sample enclosed) and 20 lbs. of silk hose, in all 110 lbs., in our bleaching machine, which has a capacity of 550 gallons of water. In this we put 10 lbs. of solozone; 14 lbs. of sulphuric acid; 2½ gals. silicate of soda, and 15 lbs. of hydroxy oil. We raised the liquor to 170 deg. F., then put in the goods for one hour in which time the temperature was raised to the boiling point. A sample was taken and we found that the cotton was not bleached as white as it should have been, so our bleacher poured into the liquor 8 lbs. of albone, and gave it 15 minutes more at a boil. The goods were then removed from the liquor, rinsed and tinted, then extracted and packed for delivery. The hose looks fine as you see in the samples enclosed, but when they are pulled over the boards and the heat strikes them, the artificial silk pulverized as in sample. Please let us know by return mail what happened in the process of this lot of bleach, as we have turned out thousands of dozens and not once did we experience such a condition. (5253)

In the bleaching of artificial silk, it is rather dangerous to rebleach, especially when processing at a boil. We would not advise bleaching this class of material above 180 deg. F. This will take slightly longer to obtain a good bleach, but there is not the danger attached to bleaching at a boil. However, there are many mills obtaining very good results bleaching at a boil.

We wish to point out that it is not the effect of the bleaching agent, but the alkali which damages artificial silk at high temperatures. There is the possibility that the solozone was not completely neutralized. This could occur by guesswork and not using litmus papers for testing the bath, or by not sufficient stirring in mixing the chemicals, allowing some of the solozone

to settle in the bottom, which upon dissolving formed free caustic soda which is damaging to artificial silk at high temperatures. The cause of the tendering of this lot of hose can be summed up and laid to the long continued boiling in the presence of too much alkali and an oxidizing agent.

We would recommend controlling the neutralizing of the bleach liquor by the use of litmus papers (14 lbs. sulphuric should neutralize approximately 10 lbs. of solozone, but the acid will always vary due to several conditions, and tests must be made to be certain). Furthermore, cut the amount of silicate of soda to 4 lbs. per 100 gals. of water (for artificial silk). After the bleach bath has been prepared, heat to 120 degs. F., instead of 170 deg., then enter the goods and pole until the boil has been obtained (if a stationary machine is used). When you heat your liquor to 170 deg. there is considerable loss of bleaching strength, probably as much as fifty per cent., that is, with no material therein.

Should you have further occurrence to add albone to the bleach liquor, do not forget that albone is acid and may throw the bath to the acid side, which will also cause tendering. In this case, phosphate of soda or soda ash should be added, enough to make the bath alkaline.

Filling Waste in Weaving

We would appreciate it very much if you could tell us what percentage of waste is allowed weavers operating individual looms on all-wool 12 cut yarn. The yarn is wound on bobbins. Small sample is enclosed. (5275)

The amount of weaver's waste depends somewhat on the length of shuttle bobbins used. With eight inch bobbins we should say that above 2% to 2¼% of weaver's waste, and about 1¾% to 2% spooling, dressing and drawing-in waste, would be allowable.

A woolen mill agent replies to this question as follows: This yarn appears to be an even and strong thread, and weave room waste should not exceed 2½%. Possibly 2% of waste would be about right. We have been working on plaid back overcoats, using 1½ run and 2¼ run yarns, composed of 70% to 75% short stock, and don't get over 3½% waste in the weave room.

Keeping Track of Underwear in Process

Could you give me suggestions on a good method of keeping track of goods for different orders of underwear, from the cutting room through the operating and finishing rooms to the stock room. We find trouble of odd dozens being lost track of which necessitates some being made over again to complete orders. Any information on this will be greatly appreciated. (5226)

The case lot system, if properly handled, will reduce the lost dozens of underwear in the finishing room to a minimum. By this method a packing order is made in duplicate for each case to be packed or put in stock, showing all details such as neck labels, box labels, paper boxes, etc. Each packing order has its individual number. The duplicate packing order is filed in some convenient place according to delivery date for future reference. The original packing order goes to the cutter, who selects from his stock the exact assortment needed; or if he does not carry a stock he cuts the goods wanted. Each dozen carries the usual work tag on which will be stamped the packing order number to enable the workers to know which case lot it is a part of. These case lots after being selected carefully are placed in a truck and wheeled to the first operation in the finishing room, which we will assume is the cuff sewers.

All dozens in the truck must be cuff sewed and returned to the truck before it can move on. After the dozens are all back in the truck it will go to the seamers, who must also complete all the dozens before it can go further. This method must be followed with all operations right through the room, until the goods are in the packing or stock room, where it will be found that the lot is complete. This system needs careful management. The operators must put the goods back in the truck from which they took them. The packing order will always accompany the truck and have the number in plain sight where it can be seen by the operators and enable them to keep the work straight.

It is expected that production in a finishing room working on the case lot system will be less than where the goods are put through in large case lots, but the goods will come through in the desired assortment and the packing room will be less congested. There will be less soiled goods and production in the packing room will be greater. The goods in process will

be less, which will result in a saving in interest charges. This system is most beneficial in a mill with a large number of styles, or where different kinds of hangers are used, or where special finishes are given for different customers.

Another way, which is much simpler and not nearly so good, is to cut and send to the finishing rooms lots of say five cases each, using different colored tags on the dozens. To illustrate, five cases will be cut and sent down with a red tag on each dozen; then follow with five cases with blue tags, five cases with white tags, and five cases with yellow tags. Then go back to the red tags and repeat the colors. Operators will be instructed to finish all dozens with the red tags before they take any with the blue tags, and so on. If followed closely, this will be the means of keeping the lots together, but it will not work nearly as well as the first method.

Cotton in Balloon Tires

Is there any trend toward the use of staple cotton, 1 3/16 in. to 1 5/16 in. or longer in making yarn for balloon tires? Are these yearns combed or carded? (5262)

The same grades of cotton and the same general processes are followed in making yarn for balloon tires as for ordinary cord tires. The usual length of cotton is from 1 in. to 1 1/16 in. Comparatively little combed yarn is being used. Although the balloon tire uses only 4 plies as compared with 6 or 8 plies in the ordinary high pressure tire, the circumference and area of the balloon tire requires approximately the same amount of cotton; that is, four pounds per tire.

Starting Marks in Weaving Crepes

We have been having considerable trouble with bad joinings or starting marks, either loose or tight, in making radium and crepe in our mill, where the weaver has had to rip out on account of floats, broken picks, or some other cause. Some of this is due to the inexperience of the weavers. But I have noted that in the case of broken picks in crepes, the weaver has taken out the few picks that are woven in after the filling has broken and let the pick wheelback the required number of picks, but the part where the filling was missing will leave a crack or loose mark. This varies according to the length of the missing filling. I have tried several ways to overcome this but have not been able to find any that works out satisfactorily.

In the case of tight or loose marks from setting the cloth on either radium or crepe, after ripping a float, etc., and the weaver gets the cloth a little too tight or too loose, it is ripped out again and when re-woven the tight or loose mark comes in the same place again. I have had the weavers rip as much as a half-inch below the mark and then set it perfect, but when it comes to the place where the mark was, it will weave the same as before, either tight or loose, and then follow up with another mark just the opposite to the first.

Is wetting the warp or cloth in any way injurious to the cloth? I have tried wetting the warp behind the reed to overcome some of these defects but before setting the cloth and starting the loom I have let the warp dry thoroughly. This has turned out satisfactorily in some cases in eliminating the defects.

In cases where the cloth has slipped between the sand roller and felt roller and caused an uneven mark at the reed, I have tried wetting the cloth where it is too loose in order to bring it up to the reed. This has worked out all right in many cases, except that it made the cloth a little narrower where I had wet it. These slip marks are caused when the weaver has to rip out two inches or more, by the cloth coming loose below the felt roller. Is there any way to overcme this slipping? Do you think a roller covered with rubber in place of felt would keep the cloth from slipping? Any information you can give me will be appreciated. All of the above work is in silk. (5280)

See that your crank arms are tight on both sides. One arm should not have more play than the other, as this will cause an uneven bang-up. Instruct the weaver to pick back about four ends more than where the broken pick has been, and then set the cloth about two picks heavier. This will eliminate any cracks.

Regarding your second paragraph about tight and loose places from ripping out, we would suggest the following: Instruct your weavers never to let their cloth back when the weights are down, as this will allow the cloth to let back unevenly. When ripping out they should always let back the cloth with the full tension on the warp, slowly, and then drop the weights.

Wetting the warp is in no way injurious and is helpful when a loose place occurs. Placing a piece of beaming paper on the sand roll at the spot where you have the loose place, and letting this revolve on the sand drum, will also help you.

Using Rosella felt on your pressure roll, which is about ¼ in. thick, will help considerably in overcoming your troubles due to the fact that the cloth imbeds itself in this felt. As it is of a soft nature, the cloth is not as liable to slip as when using a hard surface felt. A rubber covered roller will not be of great benefit. The writer has tried this out and has a loom running with one at the present time. It is covered with sheet rubber. The rubber will hold better than hard nature felt, but not as good as the thick felt mentioned above.

Finishing Cotton Warp Bolivia

We are running a cotton warp bolivia and are having quite a bit of trouble to get a lofty handle. When the goods are finished the back has a harsh feel which the trade dislikes. I suppose it is due to the cotton warp. Could you recommend a softener that would help to eliminate this? The stock is not a luster wool and the finish required should have a luster. Could you advise how to get it? (5266)

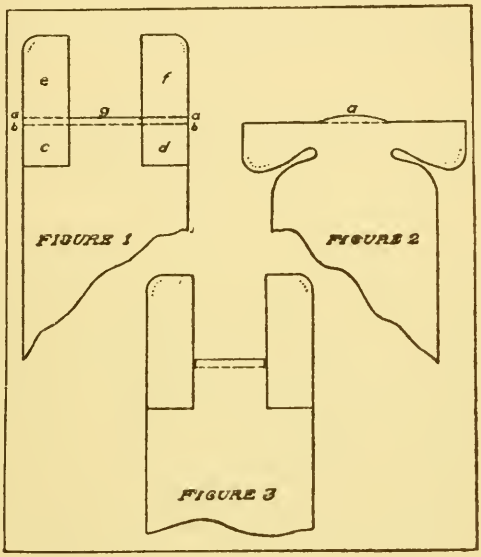
A method that can be adopted to increase luster on the type of bolivia mentioned is to steam the goods. We suppose the proposition is a piece dye, therefore steaming well before dyeing would no doubt increase the luster. In reference to softening the cotton back, would suggest crabbing at a boil on the continuous crab, tacking, and extracting the surplus water, then proceed with fulling. Another suggestion is scouring before fulling, which will help considerably. For your own satisfaction, take about 1½ yds. and give a slight napping on the back with as light a contact as possible, this process to be done in the gray, and proceed with the regular processes.

Weight of Silk in Full Fashioned Hose

Will you please tell me the amount of 13/15 denier hosiery tram pure silk in the gum that is required to make one dozen pairs of ladies' pure silk full fashioned hose of 10 thread silk on 39 gauge machines? Also give me the amounts in a 12 thread stocking. The finished boot of the stocking is to be 20 inches measured from the bottom of the heel. The high splice of the hose is to be made of cotton. Also tell me if the weights given include the waste made at the topping machine. (5236)

To answer this inquiry accurately we should know the number of courses per inch. However, assuming 46 courses per

inch on the 10 thread, which is about what the trade wants today, about 9 oz. would be used; and on the 12 thread, with the same number of courses per inch, about 11 oz. would be used. Two per cent. should be added for waste. These weights are figured on the "split sole." It makes a decided difference whether the foot is to have plaited soles or split soles with solid mercerized soles. In the plaited hose, the silk is knitted all over the foot and the sole and toe are merely plaited with cotton, whereas the split foot only uses silk between the soles and toe.



To the above figures must be added the waste at the topper's stand, approximately ¼ oz. However, methods may be employed by which the waste can be made all cotton instead of silk. The following is an illustration of this: If the method of topping a full fashioned leg is understood, the accompanying sketches will explain the meaning. In Fig. 1, line aa is the place at which part of the leg splicing, c and d, stops knitting. The silk at g is pressed off the needles, and the heels, e and f, are continued as shown. When the topper runs on the heel, she will down corners to a depth of ⅜ in. to the dotted line bb. In this case, the part to be ravelled off, a in Fig. 2, will be silk waste. However, if the silk is pressed off at the line bb in Fig. 1, and the entire space between this line and the line aa

is made of cotton, by using one of the heel carriers to run across the entire width, the topper will top through 1 to about 2 courses below bb, and the ravellings (a, Fig. 2), will be cotton instead of silk. There will be no material difference in the quality of the hose.

Another method is illustrated by Fig. 3. The part to be ravelled off is knitted separately and is entirely independent of the heels from the line bb of Fig. 1. This is accomplished by bringing into action another carrier to knit the waste part and by stopping the carriers which are knitting the heels before they reach the needles upon which the waste part is being knitted. In this way the separation is caused as shown, and, as will be seen, the waste will again be cotton and not silk.

Finishing Unfinished Worsteds

I would like to know the different finishing processes on the clear finish or unfinished worsted, and how to go about handling these goods in the finishing department. (5269)

The following treatment for a clear finished undressed worsted is recommended by a finisher: After burling and mending, put as many pieces into the fulling mill as you can; run 4 pieces or 6 pieces in a set, as it will crowd the goods if the mill is loaded to its capacity and this is an advantage. Mark off the yard mark for length shrinkage according to loom weight and finished weight required. Use 4 ozs, palm oil soap or any good fulling oil to the gallon, and 4 ozs. of alkali to the gallon. This makes a very suitable soap for this class of work. After fulling, scour with the same soap for 20 minutes, then give warm water and put on same soap and lather up again. This lather will be white. Run 20 minutes, give warm water, and then cold water. I presume that the goods are made from skein dyed yarn. If they are piece dyed clear finished goods, after washing fold out and crab with hot water at 180 deg. F., then send to dyehouse.

If you find the face too much felted in piece dyed goods, would recommend crabbing before fulling. Increase alkali for fulling to 5 ozs. per gallon. Skein dyed unfinished worsteds should not be crabbed. In case the face is too felted after fulling, reduce the amount of soap per gallon and increase the amount of alkali per gallon. This will hasten the shrinking and reduce any matting of the fabric. As this condition varies with the inclination of the stock to felt or not to felt, the

procedure must be tried out. If more felt is required thicken up your soap. It may take twice the quantity mentioned above. But be very careful about increasing the alkali, as this has a tendency to make goods feel harsh.

Tournante Oil

What is tournante oil and what use is made of it in the textile industry? (5271)

Tournante oil, or Gallipoli oil as it is called in England, or huile tournante as it is known in France, is a type of olive oil that has suffered a partial decomposition, becoming rancid and containing much free fatty acid, sometimes as high as 20 per cent. The high fatty acid enables an emulsion to be made at once by the addition of soda. It was formerly used extensively by turkey red dyers for results that are commonly secured today by using sulphonated oils.

Rayon in Narrow Fabric Mill

We are manufacturers of elastic and non-elastic narrow fabrics using cotton yarn for warps. We are contemplating using artificial silk warps and would appreciate any information that you can give us as to how the silk is handled during warping and weaving of narrow fabrics such as ribbons, where 100 ends or more are used. Our webbing is heavy, there being 1,000 ends in 1½ in. of web. Part of the warps are of cotton, which in weaving passes the silk, and there being so many ends to the inch it tends to cling to the silk in passing. We will use two silk warps with about 200 to 325 ends each of 150 denier silk. (5240)

A ribbon having artificial silk warps, or a non-elastic fabric of single cloth construction having a combination of silk and cotton warps, may be handled very differently from a heavy elastic fabric where a double cloth weave is generally employed. In the first case it should be practicable to weight the cotton warps quite heavily so that there is little liability of the cotton warp fibres interfering with the artificial silk in the weaving shed. A good clearance can generally be easily obtained. If the double cloth weave is used, where the binder warp locks the face and back cloth together, the warps, particularly the binder, can be only lightly weighted, and then the shed clearance is

liable not to be so good. This is aggravated by the added crowding, resulting from the heavy strands of rubber working in the reed spaces.

It is essential of course that nothing but best quality artificial silk be used for warp purposes. The loose fibres generally to be found in the lower qualities disqualify them for use in the warp where harness and reed friction have to be contended with. (A lower quality may be satisfactory for the shuttle.) Once any of the fibres in the warp become broken, they are liable to be separated from the main thread for some little distance, for, unlike cotton, there is practically no twist used to keep them in mass form. Nor will sizing help this to any great extent. Every precaution should be taken so as to avoid undue straining and friction, which might cause the breaking of any of the minute fibres.

The dyehouse is the most prolific source of trouble. Careless handling, violent boiling, poor making up, or some other such cause results in the breakage of many of the small fibres, and unfits the material for warp purposes. Damage may also take place to some extent in the spooling process, where rough handling of the skeins when shaking out is liable to cause fibre breakage. Care must be taken to avoid the slightest irregularity in warping, and the multiple of threads constituting each section must be perfectly taped on the beam with no ridges whatever, otherwise irregular strains when leaving the beam will be liable to break some of the fibres. Before going on the beam the threads should pass over and under a series of rods to correct any irregularity, and then pass over a narrow flanged steel roller set at such an angle that all the threads will be kept side by side as they pass on the beams. This aids uniformity.

In weaving, the silk warps should be kept entirely separate from the cotton warps at the back rolls behind the harness. It is necessary that these rolls revolve with the greatest ease. Most important of all is the method employed in the manipulation of the individual warps in the harness. Here there is most liability of crowding and friction, and every effort should be made to reduce this to a minimum. The finest and best heddles obtainable should be used, consistent with the requisite strength. The silk warps are best drawn in as near the front harness as possible, so as to avoid all unnecessary travel in the formation of the shed. All the available harnesses should be

employed so as to give the heddles plenty of room for spreading, and reduce friction from side crowding. Use a combed and gassed yarn for cotton warps, if practicable, and shed these well in the harness, clearing the silk all possible. By carefully watching all these details, many of the difficulties will be overcome.

Curl in Worsted Yarn

We are having some trouble in spinning 24s worsted yarn. We do not seem to be able to get the yarn as straight as it should be. The draft of the spinning frame is 10. The length of staple is about 10 in. We have tried the ratch at 12 in., but it does not take the curl out. We have not been troubled with anything like this before. Do you think it is in the stock? Enclosed is a sample of roving and also of top and yarn. When the yarn is put in water it looks as if some of the fibres have contracted and caused the curl. Any information would be very much appreciated. (5272)

The samples were referred to a worsted mill superintendent who repiles as follows: We were up against the same trouble not long ago in spinning 2/26s out of practically the same stock as the sample submitted. We overcame it by ratching it up to 14 in. and having 14 draft in the spinning frames. If this suggestion is followed up and it does not work, then there must be a sliight percentage of domestic one-quarter blood wool in the top, which would cause the yarn to cockle after it is dipped in water. The domestic wool, being softer, will contract more when it gets wet than the South American wool, which is straight and wiry. Therefore, it would be a very wise thing to take this up with the boss woolsorter and ask him not to throw any of his off-sorts of domestic wool in with the South American.

Draft Calculation

What is the draft or break draft between the back and middle rolls on a spinning frame geared as shown in the accompanying diagram? Also, how can a break draft of 1.70 be obtained between the back and middle rolls? (5039)

This problem may be solved as an ordinary draft problem is solved by finding the draft between the back and middle rolls. To do this, let us assume that the back roll turns once, which will mean that 1⅛ times 3.1416 inches are fed through the

back rolls. It will also mean that the 37 tooth back gear will make one turn. The 40 tooth intermediate gear is an idler, so may be omitted from this calculation and the problem treated as though the 37 tooth back roll gear drives directly the 23 tooth middle roll gear.

If a 37 gear meshes with a 23 gear and turns once, the 23 gear will turn 37 teeth, which means 37 divided by 23, or 1.6087 revolutions. Now since the middle roll turns with the middle roll gear, it also will make 1.6087 revolutions and will deliver for each revolution 7/8 times 3.1416 inches. For 1.6087 revolutions, the middle roll will deliver 1.6087 x 7/8 x 3.1416 inches. This means that for one revolution of the back roll, the middle roll delivers 4.4222 inches, while the back roll feeds 3.5343 (1 1/8 x 3.1416). Then the length delivered divided by the length fed is the amount that this strand is drawn out, or the draft, which in this case is 1.2512. This may be all concentrated in one equation as follows:

$$\frac{37 \times 7/8 \times 3.1416}{23 \times 1\,1/8 \times 3.1416} = 1.2512$$

Then 1.2512 is the present break draft and the last expression written is the usual equation used for determining the draft.

To obtain a 1.70 break draft we must change either the 37 back roll gear or the 23 middle roll gear. This change from 1.2512 to 1.70 means a greater draft and consequently the middle roll must go faster than it now goes, with the back roll making the same number of revolutions. This means that either the 37 tooth gear must be larger or the 23 tooth gear must be smaller. Because it often happens that the back and middle rolls are not very far apart, an increase in the 37 gear may make it impossible to get the roll setting desired. Consequently let us assume that we will make a change in the middle roll gear to change from 1.2512 draft to 1.70 draft. The simplest way of solving the problem is to first determine a draft constant for this gearing where the 23 middle roll gear is the change gear. To determine the draft constant, write the draft equation substituting one (1) in place of the change gear and in this case get

$$\frac{37 \times 7/8 \times 3.1416}{1 \times 1\,1/8 \times 3.1416} = 28.7876$$

From the equation it is plain that substituting the number of teeth on the change gear divides this whole equation by that number of teeth, which is equivalent to dividing the draft constant just found by that number of teeth. This division of a draft constant by the number of teeth in the draft gear gives the draft. This being so, we can say also that if we divide the constant by the draft, it will give the number of teeth necessary on the gear for that draft. So in this case divide 28.7876 by 1.70 and get 16.8823, or 17 teeth for the draft change gear, which is the middle roll gear. So for a change from a 1.2512 break draft to a 1.70 break draft, change the 23 tooth middle roll gear to a 17 tooth gear.

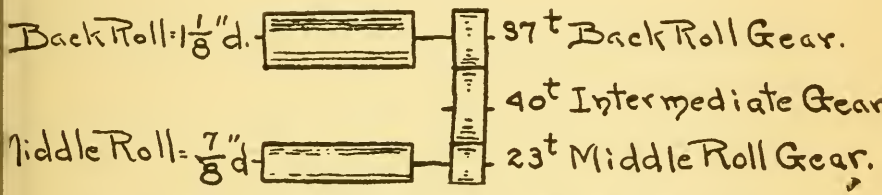


Diagram of Gearing Referred to in Question 5039

Gloss on Spun Silk Hosiery

Spun silk hose that we are making is somewhat fuzzy. What is the proper method for finishing these spun silk goods to get the best results? We want to get more gloss. (5274)

Fuzziness is one of the natural attributes of spun silk and there is no successful process that will impart a permanent gloss to goods that are made from it. One of the most satisfactory methods is to have the spun silk yarn gassed before it is put into work. This gassing removes the loose fibres from the surface of the thread and leaves it with a more or less smooth surface.

Giving a luster to hose made from spun silk by means of some treatment in the dye house may be done with a solution of gelatin. The strength of such a solution is to be determined by a few trials. Probably the amount of gelatin in a gallon of water will not exceed one ounce. The gelatin is dissolved in cold water, or rather allowed to soak in cold water, for several hours and then afterward gently heated until it has passed into solution. In this solution the silk hose may be immersed until saturated, after which they are removed and dried. Of course, the hose must be finished by boarding and pressing in the usual manner.

No chemicals or other kinds of dressings added to fuzzy yarn will impart a luster that will equal the luster possessed by thrown silk.

Card Clothing Blankets

We have received an inquiry from one of our New England connections for a quotation on card clothing blankets, 9 by 14 ft. We are not familiar with this type of blanket. Can you tell us what it is and who can supply it? (5267)

We presume your inquiry refers to blankets or coverings for cotton or wool cards, which are sometimes of rubber sheeting and are used in case of fire as a protection to the card clothing, and also for protection against dust and moisture if the cards are not running. Cotton cloth blankets are also used in some mills to cover up the cards at night or over Sundays, and at other times when the machines are not running, to keep off the dust. Sometimes they are fitted with grommets or ropes to fasten them down snugly and sometimes not. We are sending you by mail the name of a supply house that carries such blankets in stock.

Sizing Artificial Silk

We are to use artificial silk in a line of goods, and are interested in any information on sizing this material. (5268)

With the skein method, dip into a paste made from modified corn starch which has had a softener added to it, then put through a wringer carefully or hydro-extract, being sure that the skein is not twisted during the operation. Then put over a glass rod and pull gently to cause all the fibres to separate from each other when drying. Dry in air if time permits without using an oven. Size can be applied luke warm. When skeins are dried, wind on very smooth spools and then on the beam in the usual way.

One mill that we know of has made a home-made sizing outfit for artificial silk and works as follows: Silk is bought in skeins and put on spools which are placed in a creel and then the yarn is run through potato starch size at a fairly high temperature, using a comb to separate the fibres before going into the size box. The yarn passes over a brass roll which is immersed in the size and carries enough size to cover the fibres which pass over and not under this roll, thus avoiding going

into the size and getting an excess of the solution. It is a good plan to keep a piece of cloth in close proximity to the roll but not quite touching, so that any lumps in the size would be brushed off before reaching the fibres.

After leaving the size box, the yarn is separated to some extent by passing some threads over and some under bars of steel as used on the slasher, then over a home-made frame of wood which encloses steam pipes, and through another comb to a beam. Pieces of paper are placed at certain intervals when winding the beam to avoid trouble later if some of the yarn breaks.

Commercial sizes such as Bordeaux Finish and Viscogel work well on artificial silk. Of course artificial silk and cotton should not be sized at the same time, as the passing over the drying cans would doubtless bake the artificial silk; also the amount of tension used would be very detrimental. Size artificial silk and cotton separately, and be very careful of the artificial silk in regard to tension, as it does not act the same as cotton and may cause trouble in weaving.

In a paper presented before the National Association of Cotton Manufacturers, in November 1923, Warren F. Cooper of the Viscose Co. gave the following information on sizing artificial silk: It is not advisable to size more than 1500 to 2000 ends at one time. When a warp with more than this number is required, it is advisable to use more beams, and to run them together on the rebeaming or dressing machine. Owing to the "stretch" of artificial silk, and particularly so when in contact with the size, the tension on the back beam, when sizing, should be as light as is consistent with good working. When the warp is sized, there is not the same risk of the material stretching, and good results are obtained by making the weaver's beams hard with press-rollers.

In the process of sizing, the beam should be measured about every 100 yards. If the beam should "measure out," that is, prove to be high on one side and low on the other, the attendant should build up the low side to the required height by the insertion of paper. Then the presser-roll is so adjusted as to prevent a recurrence.

The success of artificial silk weaving during the last few years is attributed to a considerable degree to sizing. Just as sizing is essential to the successful weaving of single cotton yarn, so is it essential that the filaments of artificial silk be

bound together by an adhesive substance to strengthen them during the process of weaving. Artificial silk, properly sized, can be used in all qualities of cloth.

For machine-sizing, the following formulas are suitable for artificial silk:

(1) 3½ lbs. flexible starch
1½ lbs. corn starch

This mixture is dissolved in 3 gals. of water, after which it is poured into a tank that contains 15 gals. of water. The contents are then boiled and stirred for from 15 to 20 minutes. Before using this preparation it should be allowed to cool down to a temperature of 80 to 90 deg. F., and this temperature should be maintained during the process of sizing.

(2) 11 gals. water
5 lbs. gelatin
3 ozs. glycerine

Boil the mixture until scum disappears, which will require about 15 or 20 minutes. To preserve this preparation add 4 ozs. of benzoate of soda to 10 gals. of solution. This preparation can be used cold during the process of sizing.

A formula for skein sizing is as follows:

60 lbs. gelatin
198 gals. water

Soften the gelatin by allowing it to stand for a few hours, then boil for 15 to 20 minutes, allowing the bath to cool until it is luke warm before entering the silk. Dip the yarn in the bath, then hydro-extract for 15 to 20 minutes. The yarn is then ready for the drying machine, but should be shaken out before drying to prevent the threads from sticking together. This formula is preferably used for yarn having additional twist; that is, 4 turns extra to the inch.

Sizing formula No. 2 can also be used successfully for skein sizing by omitting the glycerine.

There is also considerable information on sizing given in an article entitled, "Bleaching Artificial Silk Stripes," by Percy Bean, which appeared in the October 25, 1924, issue of TEXTILE WORLD. Mr. Bean, who is a world authority on sizing and finishing, recommends a thin boiling corn starch for artificial silk and states that as a rule the size is made of such a strength as to contain about ½ lb. of starch in each gallon of mixture.

Numbering Mohair Yarn

I have been in the plush business for some time and would like to know the standard length of mohair yarn, and also if a 2/30s mohair yarn is equal in weight to a single 15s mohair yarn. (5261)

Mohair yarn is numbered on the same system as worsted yarn; that is, the hank of 560 yards is the standard and the number of such hanks that weigh one pound equals the count. In a No. 1 or 1s worsted or mohair there are 560 yards to the pound; in a No. 2 or 2s worsted or mohair there are 2 x 560 or 1120 yards to the pound; in a No. 10 or 10s worsted or mohair there are 5,600 yards to the pound. Disregarding a possible slight take-up in the doubling and twisting of two strands of 30s mohair yarn, it is correct to say that a 2/30s is equal to a single 15s mohair yarn.

Finishing O. D. Army Duck

I am enclosing herewith sample of 40 in. khaki army duck, finished 38 in., and would greatly appreciate some information as regards finishing same. Would like to know what would be the most practical way to produce the leathery feel that the sample has. (5263)

Without seeing the goods as they are dried up from the dyeing operation, before attempting to starch or finish, it is rather difficult to give an exact formula for finishing. However, goods of this type do not require much sizing material and as a rule, finishers prefer to use white corn dextrine. A good finishing combination for this class of goods would be from 20 to 25 lbs. of white corn dextrine, 1½ gals. of 50% turkey red oil, boiled to make 100 gals. This mixture should be boiled for ten minutes. The goods should be starched on a 3-roll starch mangle with two maple or sycamore rolls and a middle brass roll with compound leverage in working order, and about 30 pounds weight on each side of the mangle.

After starching, goods should be run over a cylinder drying machine and plaited down. The starching and drying can be done at one operation if the machinery is available in range. After drying, they should be conditioned and then passed over a 40 ft. straight tenter to bring out the width to a full 38 in. The goods should then be calendered over a cold

mangle or calender of five bowls, with two brass rolls and three wooden rolls, using very light pressure. This calendering is to simply mellow the finish and break it up evenly without laying down the rib of the goods. It is possible that the same results may be accomplished on a cold 5-roll calender with cotton rolls and two chilled iron rolls, without the steam being applied, but the seams on heavy goods of this type running through cotton rolls are liable to do some damage to the rolls.

Drawing for 2/40s Worsted

Will you kindly give me the following information. We are equipped with drawing for long wool; all front rollers are 5 in. in diameter. We buy botany tops and we are to make some 2/40s botany out of 66s top. The boxes we can use are:

3 two spindle gill boxes
1 four spindle drawing box
1 six spindle weigh box
2 six spindle finishers
2 forty spindle rovers
3 thirty spindle dandy rovers

What would be the best way to get the best results in the finished yarn with a set of drawing of this kind? We have made samples before but we never have been successful in obtaining as good results as we would like. (5256)

The best thing to do is to get equipment that will handle the 66s stock properly. Your stock being short you have no chance to close up enough on your ratches, especially your bottom carrier. You are too far away from the nip, which will cause very uneven drawing and naturally poor yarn. The machinery you have could be got in shape to handle such stock by putting in 4-in. front rolls and other corresponding parts to enable you to handle such stock.

The writer would suggest the following layout for single set of drawing:

1 double-head can gill box
1 two spindle gill box, bobbins 14 by 9 in.
1 four spindle drawing box, bobbins 14 by 9 in.
1 six spindle weigh box, bobbins 14 by 7 in.
1 ten spindle drawing box, bobbins 12 by 6 in.
2 eighteen spindle dandy finishers, bobbins 9 by 5 in.
3 twenty-four spindle reducers, bobbins 8 by 4 in.
6 thirty-six spindle dandy rovers, bobbins 6 by 3½ in.

This is a very nice layout although the machinery builders might be able to offer you some other that would possibly cut out the 18 spindle dandy finishers. On the other hand, you might be able to pick up satisfactory second-hand machinery, although you would have to take something a little different in the size of bobbins. The machinery mentioned in the inquiry is far from that needed to spin 2/40s out of 66s top.

Heavy Places in Silk Hose

Enclosed you will find a pair of silk hose which when held up to the light and looked through appear to have heavy places in them. These places appear to me like a variation in the yarn. They run across the hose and are mostly down toward the ankle, but not always at the same place, and the streaks or bars are not all of the same width. The dyeing has been blamed for the trouble; also it has been thought that difference or variation in tension was the cause. Will you advise what the heavy places are due to? (5265)

There is not the least doubt that the trouble is with the silk. It is not unusual for silk to have these irregularities. The dyeing could not cause the heavy places.

Sizing Burlap for Needled Hair Felt

Can you give me any information relative to the materials used for sizing burlap before it is needled with hair felt? I would like to know what materials are used, how the sizing is mixed, and how it is applied to the burlap. (5264)

There seems to be no generally accepted method for sizing this burlap. A great deal of the felt is made without sizing. Where the burlap is sized, the solution used is a mixture of starch and water, or glue and water, the proportions varying, depending on the viewpoint of the mill or the man in charge. Any arrangement of rolls that would depress the burlap in a starch or glue solution may be used. In some cases the burlap is simply passed between the nip of two rolls, the lower one of which may be half submerged in the starch or glue solution. In this way the burlap is not immersed in the solution but is impregnated by the solution that is picked up by the lower roll.

A correspondent replies to this inquiry as follows: I have never personally had charge of a plant of this kind or had the determining of the character of sizing in the burlap. I

do know, however, that a lot of this type of felt has been made without any sizing whatsoever in the burlap. Every factory of the type which I have been in has been doing things in an entirely different way and I do not believe there is any standard procedure. All the places where I have seen them sizing the burlap they were using starch such as would be used for cotton warps, and it was put on without careful boiling.

Finish on Mercerized Broadcloth

I enclose herewith two small samples of mercerized broadcloth, one white and one pink. I would greatly appreciate it if you would kindly tell me how to finish these to get the same high degree of luster and silky feel. You will notice the threads in the samples stand out well and are not flattened in any way. (5257)

There are some fabrics which very few men know how to handle, and this is one of them. The fine goods bleachers that are making a success of such work are paying high-priced finishers for expert services. As a matter of fact, we understand that the finishing alone is not the entire difficulty that some plants are having in producing this broadcloth. The following method of finishing should give something approaching the desired silky feel and luster exhibited by the samples if the fabric is right to start with:

Singe thoroughly, pad through caustic soda solution of 5 deg. Tw. and run into kier. Give two 8 and 10 hours boils with caustic soda, washing well between boils. Wash goods thoroughly, dry and mercerize through strong caustic of a concentration of 52 deg. Tw. or slightly higher, keeping temperature below 70 deg. F. and stretching on tenter frame to as near gray width as is possible without damaging the cloth. After mercerizing, wash, sour and bleach with chemic in the usual manner. When bleaching is completed and the goods have been soured and washed, dry on cans. Colored shades may now be dyed on either pads or jigs and dried on cans. In finishing the fabric saturate with a solution of turkey red or other sulphonated oil, mangle, dry on cans, and stretch to desired width on a 60-foot tenter. To enhance the feel and luster, goods of this class are almost invariably given at least a slight calendering; for this purpose a five bowl calender is suitable. This concludes the processes and the cloth may be folded, put up and packed.

Poor Selvage on Cloth Woven in Box Loom

I am sending two pieces of cloth for your examination. You will notice one piece has a perfect selvage and the other has a very bad selvage. These two pieces were cut from the same cloth, one from each side. Can you inform me what is the cause of this bad selvage and what to do to stop it? (5250)

The swatch showing the satisfactory selvage is from the side of the cloth that was nearest the dead box in the loom (2 x 1, 4 x 1, or 6 x 1 box loom). There being no obstruction to catch the filling as it was given off the shuttle, it wove into the cloth correctly. The sample with the defective selvage is from the side of the cloth which was nearest the box motion in the loom. From its appearance we should judge there was some obstruction on the race plate or shuttle box of the loom which caught the filling yarn as it was given off the shuttle and this loose yarn was dragged into the cloth. In weave room parlance this defect is sometimes called "picking-in."

One remedy is to cover the outside of the mouthpiece of the shuttle box (box motion side) with slasher cloth flannel. Sometimes a spinning frame band is attached to the lugs on the mouthpiece of the shuttle box and placed vertically to the race plate. This band, being of cotton, has a few short loose fibres, and the filling in passing will rest against these fibres and be out of the way of the shuttle. Being out of the shuttle's path it will not be drawn into the cloth.

Chemicking Cotton Piece Goods

Can you give me information on the chemicking of cotton piece goods? I would like to know the usual strength for organdie, voile and also heavier goods. What is the best method to determine whether the goods have been sufficiently chemicked? What effect will acid or caustic soda left in the goods have upon the bleach? It is the intention of the plant where I am employed to add a wash box and chemic pit to the tenter mercerizing frames, which already have two wash boxes and a sour box. Where can I get a practical book on bleaching and mercerizing? (5260)

The heaviest or strongest chemic liquor which the writer ever had any occasion to use on cotton goods was about ¾ deg. Tw. As a matter of fact, it is preferred to use an average

of ½ deg. Tw. provided there is ample time in the chemic bins to give a sufficient length of treatment with this liquor to get a slow but prolonged action. A chemic liquor of this strength can be used for periods of 45 minutes to two hours without materially affecting the strength of light goods. On heavy goods, of course, such as sheetings, shirtings, nainsooks, etc., it is probably better to use ¾ deg. chemic for a little speedier action. The strength of chemic and the length of treatment depend, of course, a great deal on the quality of the kier boil. It is a well recognized fact that goods boiled twice in the kiers do not require such strong treatment with chemic. The only method of determining the sufficiency of chemic treatment is by the general appearance of the goods.

The practical bleacher, of course, becomes used to a certain strength of chemic and knows by actual practice the length of time that is required for a certain weight of goods to become bleached to a set white. The great difficulty with attempting to set down any rules and regulations is that different men have their own ideas of treatment. For instance, we have known of the older type bleachers using a light bleach process who used to chemic at ¼ deg. Tw. on sheetings and pillow tubings, and they would allow their goods to stand in the chemic bins over night.

Regarding the question of the effect upon the bleach of acid or caustic left in the goods, the effect of acid is that, of course, which is commonly known as "a bowk sour is formed," which is a very energetic and quick action. This is somewhat detrimental to the strength of goods and very disagreeable in the bleach house due to the fact that it causes the bleaching liquor to throw off its chlorine, making a very disagreeable odor which is injurious to the membranes of the human nose and throat.

Caustic soda left in the goods in slight traces is not in any way really injurious, but it retards the action of the chemic, and in fact makes a very mild bleach. It is much better, however, to have the goods washed thoroughly clean both from acid and caustic soda.

The writer notes the remark of the inquirer to the effect that his present employers intend adding a wash box and chemic pit to their mercerizing outfit, which is already equipped with two wash boxes and a sour box. We do not personally think much of this idea, as it is impossible to wash goods thor-

oughly clean in an outfit similar to a 3-compartment washing and souring outfit. If goods are to be dyed after mercerizing and bleaching, we are afraid that trouble will be experienced from resists, etc. As a matter of fact, within the last few years well posted mercerizers and bleachers are eliminating the souring treatment after mercerizing and are installing larger washers. For instance, up-to-date mercerizing ranges rarely are built with less than four or five washing compartments in which hot washes and spurt pipes are used to remove all traces of caustic, with the idea of deriving all the possible benefit from the standpoint of recovery of caustic soda.

The best book which the writer knows of for a bleachery man is "The Chemistry and Practice of Finishing," by Bean & McCleary, which can be secured from the Book Department of TEXTILE WORLD.

Streaks in Dyed Hosiery

I am sending sample of hose which shows the top, heel and toe to be streaked in dyeing. I would appreciate it very much if you would advise me whether this is caused by the yarn or is it the fault of the dyer? (5258)

A careful examination of the sock reveals that the cotton is unevenly dyed or colored, while the unevenness appears in horizontal bands. This indicates that the trouble is due to the yarn. The inquirer should try another yarn and see if the difficulty is removed. Where such unevenness exists, there is no method that will correct it except to strip and redye. There is nothing about the one sock submitted that indicates any fault of the dyer. Except for the irregularity in the bands above noted, the dyeing is very good.

Functions of Carriers in Spinning

Do the carriers on a worsted spinning frame perform any drafting? I have heard this argued by men with several years' experience. If there is draft on carriers, would you figure same out for me? (5251)

The functions of carriers are as follows:

(a) To control the passage of short fibres from back roll to front roll.

(b) To hold the twist in the roving, thus preventing it from running to the nip of front roller, and so further helping to control the passage of short fibres.

(c) To support the end or ends between back and front rollers. In order to do this work efficiently they must

(d) Be of the correct size, and weight of tumblers must be sufficient to obtain required pressure.

(e) Have a greater surface speed than the preceding roller; thus in a spinning frame with three lines of carriers each line would have an increase in surface speed. Taking the back roll speed as 1, we would find carrier speeds as follows: back carrier 1.11; middle carrier 1.21; front carrier 1.275, for a certain make of frame.

While these surface speeds seem to indicate a draft between each pair of rolls, actually there is no draft because the pressure exerted by the tumblers upon the roving is not sufficient to enable the carriers to draw the fibres, but this pressure allows the fibres (gripped by the front roll and being drafted) to slip between the nip and yet at the same time (due to the holding of the twist in the roving) prevents the short fibres from being drawn unduly forward.

Spots on Voile

We enclose a sample of voile and ask you if you could identify the character of the spots on these goods. (5252)

We have made tests on the spots in the samples submitted and find such solvents as ether and chloroform tend to remove some of the color, which might indicate that it was lubricating oil dropped on the goods.

Unevenness and Bronzing in Dyeing Yarns

We are having trouble in dyeing a good level sulphur black on unboiled cotton yarn in a skein dyeing machine, capacity 500 lbs.; metal is cast iron. Our trouble is uneven dyeing and bronzing. We also find small white spots on some lots which have resisted the dye entirely. We are asking if you could advise us just what to do to overcome our difficulty. (5242)

The trouble with unevenness in the dyeing of the unboiled cotton yarn may be due to a defectively balanced recipe for the particular sulphur black that you are using. From the fact that you mention "bronzing" the writer is inclined to believe that part of your trouble is due to too much dye in the bath; or that there is a sufficient quantity of black for the shade

of black you desire but an insufficient amount of sodium sulphide. Why not have one of the technical men from the dyestuff houses come to your plant and let him run one or two lots through?

Your complaint regarding the white spots is very indefinite, and does not give one at a distance much to form an opinion on. Such spots may be due to poor penetration of the dye liquor through the yarn, or they may be due to small portions of dead cotton present in the yarn. Dead cotton has the property of resisting dyeing, and frequently goes through the dyeing process barely stained. Only the microscope can determine this for you with certainty.

The following additional information on this inquiry was sent in by a reader:

I have just noticed the inquiry (No. 5242) on sulphur black dyeing in the Nov. 22 issue. The difficulty under discussion sounds just like an experience that caused us a great deal of trouble until run down. We were dyeing mercerized and unmercerized cotton yarn, all previously boiled and thoroughly wet out. The black gave the impression of being excellent but close inspection showed it to be shaded, with some places very dark and even bronzy, and others very light and sometimes really white. These undyed parts were especially noticed under tie-bands, if they were a little tight. The knots in the tie-bands were very white inside, indicating poor penetration.

The cause was decided to be the standing of the dye bath for too long a time between usings. Although the usual methods were followed, it did not come back to proper condition, even after several lots were put through. The real difficulty seems to be that the color in the bath gets out of solution, and even though large excesses of sodium sulphide are added, still the concentration of the bath in terms of sulphide per gallon is not sufficient to cause the redissolving of the dyestuff. It is obvious that the condition of trying to dissolve color in a large dye bath is very different from that of dissolving it in the relatively very concentrated solution when the sulphur black is dissolved in a bucket or barrel, with the regular amount of sulphide as usual before adding to the dye bath.

It is a fact that sulphur black is sometimes dumped directly into dye baths and dissolved by merely boiling them up, so there may be other factors that have rendered the dye in old baths more insoluble.

At the time of our trouble a special effort was made to find out how long a bath could be kept without using. As a matter of fact, nobody seemed to know, and we received answers varying from one week to several months. In our own experience, using a bath that had been idle much more than a week was risky. This factor will vary with the kind and size of the machine, condition of the bath when it is left, and how well it is covered.

It is possible that other causes may give similar effects in dyeing, but light spots are not so common as bronzing. Sometimes very clear small white spots are caused by the retention of air bubbles which may persist through the entire dyeing process. They are usually very easily recognized.

The best remedy for any such trouble that is at all persistent is to run the bath down the drain and start over with a good reliable brand of black and a proper formula.

CHAS. F. GOLDTHWAIT.

Difficulty with Static Electricity in Braiding

We are having trouble with our braid running into the braider and are at a loss to know what causes it and how to overcome it. We would most certainly appreciate your advice on the matter. The braider seems to act like a magnet and the braid also runs on the side of the cans. We thought it might be due to static electricity, or may be that the yarn contains too much life. We have tried spraying water on the braider, which helps but only for a short while. We are making non-elastic braided tapes. Your advice on how to overcome this trouble and the cause of it will be appreciated. (5248)

From the symptoms which the inquirer describes we should at once suspect the accumulation of unneutralized static electricity. Of course there are two possible remedies. An increased relative humidity would reduce the tendency to generate static. It would also in all probablity increase the pliability of the braid and favor its better behavior. The difficulty might be removed by continuous discharge of the accumulated static through an electric neutralizing device, or the inquirer might get rid of it or ease his difficulty by some simple means such as the use of grounded wires located at such points as would dissipate the accumulating charges.

Improved atmospheric conditions would no doubt entirely remove the source of trouble. The fact that the inquirer has

tried spraying water on the braiders with some improvement increases the probability that the trouble is due in part to static and in part to a harsh condition of the material.

Warping a Pattern

I am anxious to learn the proper method of warping the following pattern: There are 8 ends of blue weaving plain, followed by 2 ends of white drawn through one heddle and weaving as a cord. This is followed by 8 ends of blue weaving plain and then 2 ends of yellow weaving 2 up and 8 down. What I would like to know is on which beam I should place the 2 ends of white; on the top beam with the yellow or on the bottom beam with the blue? (5246)

We should put the white on the bottom beam with the blue, as both ends of white are drawn through the one eye in the harness and the weave is in effect a plain weave. We think you will have no trouble because the two ends, being in one eye, will twist one way and then the other, thereby taking up any slack that may occur. Also the reed will beat up a little of the slack at every pick.

Gain in Length in Finishing

In bleaching and finishing the following goods what overage in yardage should we get?

46½ in. gray width, 43½/44 in. finished width, 1.44 enameling duck; 38 in. gray width, 36 in. finished width, 8 oz. D. F. enameling duck; 30 in. gray width, 28 in. finished width, 6 oz. S. F. enameling duck; 48 in. gray width, 43½/44 in. finished width, 2.25 48/48 sheeting; 40 in. gray width, 36 in. finished width, 2.85 48/48 sheeting.

The writer has had a number of discussions on this matter and your advise will be appreciated. (5245)

Definite figures that will hold for all conditions cannot be given, of course. The tension in weaving, the type of loom, and many other things affect the gain in length in finishing.

In our opinion, 46½ in. gray, 43½/44 in. finished, 1.44 enameling duck, should show not less than 3% to 3½% gain in length.

The 38 in. gray, 36 in. finished, and 30 in. gray, 28 in. finished, 8 oz. and 6 oz. enameling duck should show 2½% to 3% gain in length.

The 48 in. and 40 in. gray, finished 43½ in. and 36 in., 48/48 sheeting, should show as high as 4½% gain in length.

The writer believes that the above figures are fairly representative. Care must be taken in the bleachery, however, to see that no excessive cutting of remnants, etc., is resorted to.

Waste in Processing Artificial Silk

If possible, kindly advise us what percentage of waste we ought to expect on throwing 6/3 artificial made from 150 denier "C" quality American viscose silk. Any information in regard to this matter will be greatly appreciated. (5022)

The following is from a large user of artificial silk: The waste in winding is from 4 to 6%. In the other processes the amount of waste will depend on what process you use for doubling and twisting and on what size bobbins you use. The larger the bobbin the less the waste, if bobbins are made properly. The doubling and spinning waste will vary from 2 to 6%.

Weaving Seersucker

Enclosed find a small piece of cloth. I am interested in finding out how this cloth is woven. I would like to know how the wave or crimp effect is obtained. Could you favor me with a description of the method that is used for this purpose? Is it woven on a plain or a fancy loom? (5239)

The cloth is what is termed a seersucker and the weave, technically speaking, is a plain weave. But the six black warp threads in a stripe have the appearance of lying flat, while the four white warp threads in a stripe have a crimpy or wavy effect. It is necessary that this cloth be woven on two separate sets of harnesses even though the weave be plain. The black warp threads are drawn on four harnesses actuated by a pair or cams or a dobby head. The white warp threads, or seersucker threads, as they are called, are all drawn upon two other harnesses and actuated by either cams or dobby head motion. The crimp is obtained by timing the harnesses containing the black threads so that they will close a little in advance (say ½ to ¾ inch) of the closing of the harnesses containing the white or seersucker yarn.

The warp yarn for this cloth must be slashed on two separate beams. The black yarn or ground warp yarn is wound

on a beam (called the bottom beam) to a given length, while the white or seersucker yarn is wound upon another beam (called the top beam) to considerably greater length. In the case of the sample of cloth sent, the ratio is about 1 inch of black yarn to 1.45 inches of white yarn. In other words, for every 100 yards of black yarn wound on the botton beam it will be necessary to wind 145 yards of white yarn on the top beam.

When putting these beams up for drawing-in, the black or ground warp should be on the bottom and should pull off from the drawing-in frame. The white or seersucker warp should then be put up above the black warp and should pull from the bottom of the warp toward the drawing-in frame.

The white or seersucker yarn is run over a slackener bar on the loom so that when the lay is beating-up the filling yarn a certain amount of give will be obtained, thereby forming the crimp. Also it is very essential that only a friction let-off be used on each beam and that the yarn be kept at the correct tension. The tension should be looked over two or three times a week by measuring the yarn and watching to see if the correct amount of white is weaving in with the black.

After the above answer had been printed a reader sent in the following comment:

I notice in the Nov. 15 issue that one of your readers asks for information on how to weave seersucker. The answer you gave him calls for two sets of plain cams. Please ask the brother to try the system that we use which needs one set of common plain cams. Run on two beams, ground on bottom beam, seersucker on top beam. Where you suggest a slackener bar for top beam, we use a common bar attached to the loom side with thin place preventors with springs. Then we connect straps from this bar to the reed cap on both sides so that when the reed strikes the cloth the bar is pulled forward about one-quarter of an inch. If the strap is set to pull too much, you might have trouble with your warp stop motion. Hoping to assist whenever possible, I beg to remain,

Yours very truly,

A. A.

Black Stocking Turns Gray

We are enclosing a pair of our stockings which have been worn and washed. We wish to call your attention to the grayness in the feet and rear of the ankles. We have come to the conclusion that this discoloration has been caused by perspiration which was unusually strong, or contained an acid not usually found in the perspiration of the average person. The stockings were dyed with developed black and are supposedly absolutely fast, but in this case, we know they were not. Have you any suggestion as to what we should do to overcome this tendency to discolor or turn gray when worn by certain individuals whose perspiration is unusually strong? (5230)

It should be remembered that a well dyed diazotized black is one of the fastest blacks available to the dyer, especially if it is given sufficient time in both the nitrite and developing baths. It is also to be remembered that the acid of human perspiration is not sufficiently "strong" to affect a well dyed diazotized black in the comparatively short time that this pair of stockings was worn. We infer this because the gilt lettering on the sole of one of the stockings is still intact. We think, however, that the chief trouble in this instance is due to contact with a strongly acidified shoe lining, but before final judgment is passed in this case, this point should be investigated. Shoe linings, especially leather linings, have caused similar trouble, the result being blamed to both bad dyeing and to perspiration.

Bleaching Wool and Artificial Silk Knit Cloth

We are enclosing three samples marked No. 1, No. 2 and No. 3. No. 1 represents sulphur bleached, plain knit, 12-gauge cloth, wool 55%, artificial silk waste 45%. Kindly advise the best bleach for this type of cloth. This cloth lost 20% in scouring and bleaching, or from greasy cloth to finished cloth. Our all-wool cloths in this grade stock lost 14%. A fine powdery fuzz seems to fall from this when handled after first drying. At what temperature will we get best results for above materials? No. 2 shows cloth in grease as knit. No. 3 shows artificial silk garnetted waste as used. (5234)

The above samples were examined very closely and it was found that the fine powdery fuzz complained of was nothing more or less than the short staple artificial silk waste. It was noted that the silk fibre ranged from eight inches to one-sixteenth of an inch. The various handlings the material is subjected to of course will (if not done with extreme care)

break up this very weak fibre into still smaller pieces. Also any alkali will tender this material if not completely rinsed out. Tendered artificial silk when dried and handled will fall from the fabric in the form of a powdery fuzz such as you complain of. This accounts for the difference in the loss of weight between this fabric and all-wool fabric.

The writer believes that the peroxide bleach, though slightly more expensive, is the best bleach for any wool mixture. The sulphur bleach is not a permanent bleach. The cloth will return to its original color after the first wash or after it has been exposed to the atmosphere for a short period of time. The peroxide bleach leaves no injurious chemicals in the cloth nor does it have any disagreeable odor.

When scouring this class of material, use a good grade of neutral soap and if you must use an alkali, use silicate of soda (not over 2%). Scour at 120 deg. F. When drying, use the lowest temperature possible to keep up the required production; 170 deg. F. should give satisfactory results.

Odor in Bleached Blankets

We make an all-wool bed blanket and use a tallowless soap to full and scour same. We bleach with sulphur and put up the blankets wrapped in kraft paper. We are troubled with a disagreeable odor in our blankets and will appreciate it if you can give us a remedy. This odor disappears after a few days when the blankets are removed from the paper wrappings. Is this odor from the bleach, soap or paper? (5235)

The sulphur bleach leaves cloth with a rather disagreeable smell. However, it should not be difficult for you to distinguish this odor from another. There is no cure for this excepting a change of bleach, that is, without losing the benefit of the bleach. Should the odor be of the rancid type, this would come either from the soap used in fulling and scouring, or from the oil used in conditioning the stock previous to weaving. It does not take a tallow soap to produce a rancid odor. The fulling soaps usually made from palm oil will become rancid and leave this odor in the cloth. Any oxidizable oil will become rancid.

If your blankets have the above type of odor, the first thing to do is to scour them thorougly (after the fulling) and then give at least three warm rinses to remove any soap from the material. More rinses should be given if necessary. In

some plants it is customary to leave a small amount of soap in the cloth previous to sulphuring. This is bad practice as the soap is precipitated upon the fibre and may leave a bad odor or cloudy spots.

Finally, there is a possibility that the odor could be caused by wrapping paper. Kraft paper is usually dyed with basic dyestuffs and fixed with a solution of rosin. The action of the sulphur fumes still in the cloth may react with the dyes in the paper (reduction) and cause an odor, but this possibility is remote. If the above suggestions fail to eliminate your difficulties we shall be glad to examine a piece of your material. When forwarding be sure it is wrapped in the kraft paper.

Streaks in Hosiery

We are mailing you two stockings which we would like to have you return after inspection. We are having some trouble from streaks in the dyeing. These streaks are more or less mechanical dents and we would like to inquire as to what you think causes them and how it will be possible to overcome them. (5227)

The streaks that show so distinctly on both the black and brown stockings give every indication of resulting from surface chafes, evidently due to friction of the stockings against each other and against the inner surface of the dyeing machine. A careful examination of both stockings does not show any evidence of mechanical trouble, which excludes the possibility of the knitting machine being at fault. We do not know how you operate when dyeing these goods, nor have we any information as to the kind of dyeing machine you use, but we think that if you could load your dye kettle a little fuller, so as to decrease the free space somewhat, the chance of surface friction would be correspondingly reduced.

Variation in Width of Webbing with Rayon Filling

We are enclosing a piece of lisle elastic webbing with artificial silk filling. The variation in the width of this webbing is frequently uncontrollable at the loom. Sometimes this trouble is very slight, then again it will appear very bad like the sample. Is it possible this can be due to some feature or variation in the artificial silk filling? We will be glad to have your opinion on this matter. (5233)

A careful inspection of the sample of artificial silk lisle web submitted leaves little doubt that the trouble complained of arises altogether from some irregularity in the process of dyeing the silk. If the narrow sections of the web are examined closely, holding the web sidewise, there will be seen at regular intervals small sections of what appears to be a slightly different shade. At these particular points the selvage of the web has a sawtooth effect which, continuing for any distance, keeps repeatedly nipping in the web and narrows that part considerably.

A fault of this character is liable to develop at any time with skein dyeing if the utmost uniformity is not maintained in all the different processes through which the material passes, and it is difficult to determine the exact cause of the trouble on account of the erratic manner in which it may appear in the goods during the process of weaving. Sometimes the trouble appears only slightly, and then again it is present in a more aggravated form, as in the sample submitted.

Even when all processes have been carried out with strict uniformity, the final result may be spoiled by poor packing in the hydro-extractor, or failure to have each skein properly opened up for passing through the dyeing machine. If the skins are not dryed properly there is likely to develop an irregularity of color and working conditions in the shuttle, which will produce just such an effect in the goods as is seen in the sample submitted.

There is no remedy that we can suggest to correct this trouble at the loom so that such silk can be satisfactorily used for shuttle purposes after it is once on the spools. Absolute uniformity in all processes is an essential for dyeing material that is to be used for filling.

Filling for Peau de Cygne

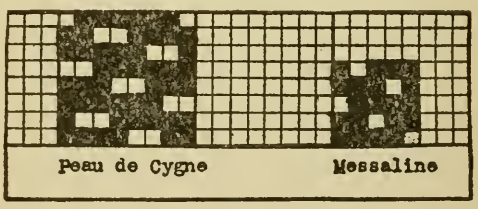
Please advise me whether souple or micuit is used for filling in Peau de Cygne. (5270)

The first thing to consider is what the correspondent means by Peau de Cygne (French for skin-of-swan). Peau de Cygne, a well known fabric, is woven on eight harnesses, and while the binding threads are distributed in a somewhat satin-like form, yet it is to be carefully observed that each filling thread, where it comes to the surface, crosses two warp threads. Therefore, instead of the filling being concealed as it is in an ordi-

nary satin weave, it is distinctly visible on the face of the cloth, and gives to it a somewhat "mealy" appearance. For this reason the fabric sometimes goes by the name of Paillette de Soie. "Paille," in French, means straw, so that the translation might be "straw-like of silk"—not a bad appellation. (Draft of the weave is given herewith.)

For filling in this fabric, bright silk is generally used, and micuit, having less gum left in it than souple, will be preferable to souple. Of course, if brilliancy was no object, souple could properly be employed.

It happened that several years ago, at a time when Messaline (a five-harness yarn-dyed satin of which draft is presented herewith) was being greatly used, word came from France that Peau de Cygne was the coming thing. This did not at all suit the makers here of Messaline, as to turn out a Peau de Cygne would have involved the changing over of their looms from five harnesses to eight harnesses, and would have made thousands of pieces that were in stock and in process back numbers, and would also require the use for filling material of a higher quality of silk than what they had been using for the Messalines. For in a Messaline the filling is completely covered up, while in Peau de Cygne it must be seen, thus being correspondingly somewhat more expensive to make. Most of the manufacturers met the situation by simply taking their Messaline fabrics and having them somewhat differently finished, putting them under different quality numbers, and then boldly offering them as Peau de Cygne. In the slang of the day, the trade "fell for it," and have kept on buying Messaline under the name of Peau de Cygne.



If this is the fabric to which the correspondent refers, the answer is that the filling can either be bright, souple, or micuit, according to the judgment of the manufacturer. A great many such goods are made with souple for filling, which gives a good body and firmness to the cloth and, if there is a proper

amount of warp, there will be no appreciable diminution in the luster of the fabric. Of course, if the warp is poor and open, a duller appearance of the goods will be the result of its use. In such a case, bright dye is more properly to be used, with the drawback, however, that the goods will be more flimsy to the touch than if souple had been used. Between these two comes the micuit, which might reasonably be employed in place of the bright in warps of the more open construction.

JAMES CHITTICK.

Piece Dyeing Flannels

Will you please advise us whether a lead-lined tub would be practical for piece dyeing flannels? We know it would stand acid but are not certain about the dyestuff. We are using wood tubs and have great difficulty changing from one color to another on account of the dyes soaking into the wood. We will appreciate your prompt advice and if you have any suggestions will be glad to have them. (5202)

Many of the best dye kettles in use are made of wood, although there are many new ones that are metal lined. Lead, however, has never proved its advantage in dye kettles, although it is extensively used as a lining for carbonizing kettles, and for other purposes. We believe that shades obtained in lead-lined kettles will not appear as clear as they otherwise would if dyed without the presence of lead. The reason for this is that all wool contains a small, though appreciable amount of sulphur, which will react with the lead, forming sulphide of lead, a brownish-black substance that would flatten any shade dyed in its presence. There should be no great difficulty in thoroughly cleaning out a dye kettle after it is once used for a given shade and before proceeding with a new shade. Probably boiling-out with a few pounds of soda ash between dyeings will overcome the trouble.

Finish on Sheeting

I am enclosing herewith a small sample of 30 in. sheeting, and would greatly appreciate through your Questions and Answers Department a formula to produce the same finish and feel as is on the sample; also information on the method of procedure, etc. (5225)

It appears as though an effort has been made on this fabric to imitate a voile finish and the result shown, taking into con-

sideration the quality of fabric, certainly is very good. We would suggest the following procedure:

The goods after sewing up in the gray should be passed over a gas singer of four to six burners and singed on both sides. After the singeing they should be treated with some diamalt product to remove sizing matter and other foreign ingredients. They should then be given one kier boil for twelve hours, washed and bleached, and dried up ready for dyeing. The writer assumes that this color is not an attempt to produce a fast color, because of the fact that it shows a slight amount of crocking when rubbed with a damp cloth. This shade can be dyed in jigs, although there are certain finishing concerns who would attempt to produce this color on a padding machine for high productive results. If the goods are jig dyed there is no need to dry them after bleaching as they can be wound on rolls at the water mangle and taken to the dye jigs.

After dyeing, the goods should be thoroughly dried over a range consisting of a 2-roll starch mangle, six drying cylinders and a 90 ft. swing tenter with winder at delivery end. The starching ingredient consists of about 25 to 35 lbs., of white corn dextrin, cooked for ten minutes to make one hundred gallons of starching liquor. The starch mangle should be one with a top wooden roll and a bottom brass roll, and the writer would suggest that fairly heavy weights, that is, from 20 to 25 lbs., be used on each side of the mangle on compound levers to get proper penetration of the starch into the yarns.

On the drying cylinders it is only necessary to run a small amount of steam to just slightly treat the goods before they hit the center. The full woolly effect on the finish of these goods is, unquestionably, obtained by swinging the tenter and having the goods pulled slightly over gray width, if possible one inch wider than gray width. In order to accomplish this result, of course, the goods will have to come well down the length of the tenter in fairly damp condition, where they will dry on the tenter with the finish as shown by the sample. After winding up at the end of tenter they should be ready to put up or fold up.

Streaks in Dyed Mercerized Hosiery

We are sending you herewith a pair of mercerized half hose, showing a condition that we have found quite frequently in our dyeing; that is, a dark streak in the cordovan lots. The writer is under the impression that this is caused by uneven

mercerization of the yarn. We have it on some other colors, but it shows up worse in the cordovan than in anything else. If you can give us any information as to just what causes this, and the necessary steps to eliminate it, we certainly will appreciate it. (5228)

The dark streaks give every indication of being due to uneven mercerization. The socks are apparently dyed with direct dyes, which always have a greater affinity for mercerized cotton than for plain cotton, and consequently show up unevenly when the mercerization is uneven. The only way to overcome this difficulty is to make sure that you are buying evenly mercerized yarn, and we suggest that you place your problem before your mercerizer. Where proper time is given to the process by the mercerizer, using caustic solutions of proper and uniform strength, such unevenness as your sample shows will not occur.

Perhaps in no branch of textile manufacturing is there greater necessity for thorough and uniform mercerization than for knitting yarns. Since the affinity of direct dyes is greatest towards fully mercerized cotton, and least for unmercerized cotton, all shades of a given dye are likely to show distinctly on hose or stockings made from unevenly mercerized material, and this seems to be so in your present case.

Holes in Bleached Rayon Hosiery

Enclosed you will find a stocking that has been bleached with peroxide and I would like to have your opinion as to what caused the holes. About 25% of the lot is in this condition. The stocking does not seem to be tender and none have any stains that would indicate the presence of iron. The lot was boiled off with soap and sal soda, then bleached for eight hours at 160 deg. F. with bleach bath on alkaline side with silicate of soda. (5034)

There are so many causes for holes in artificial silk hosiery that without further information as to the equipment used, and how the bleaching operation is carried out, step by step, it would be rather difficult to specify the exact cause. Enumerating some of the most common reasons for holes may be of benefit, however.

No doubt you are aware that artificial silk when wet, even with water, loses a large part of its tensile strength. If the hosiery is poled with a sharp or rough stick or pole, holes will certainly result. If a paddle machine is used, the hose may

tangle or get caught on the paddle wheel or between the body of the machine and the paddle wheel. Even some of the modern rotary laundry machines, if the hose are thrown in loosely, may cause holes by tangling or fraying against rough spots on wall of machine. Naturally great pains must be taken in handling artificial silk when unloading. If tangled, do not pull until something gives but carefully disentangle and then unload.

Now for chemical reaction: In boiling out, are the chemicals, especially the sal soda, thrown into the machine without previous dissolving? Should any of the soda crystals or powder fall on the artificial silk, a weak spot is the result. On the boards this spot will pop out and a hole results.

Iron and copper oxides in contact with any fibre in a peroxide bleach bath will produce tendering, but if it were this you would also notice holes in the cotton tops, heels or toes, which is not the case in the sample submitted. Holes due to iron are not necessarily accompanied by iron stains.

Have you ever noticed a jelly-like substance floating on the surface of the bleach liquor? This is no doubt silicic acid and could produce holes where it came in contact with artificial silk. To overcome this the writer would suggest that you use at least 3 lbs. silicate of soda, 42 deg. Bé., to every 100 gals. of bleach bath.

It is noted that your stocking is exceptionally harsh. This should not be so unless you are scrooping. Use about 1 qt. of any good sulphonated oil to 100 lb. of material. Add this to the bleach bath. It is advisable to bag artificial silk hosiery when processing.

Cloth for Warp Knit Fabric Gloves

I have been working in a silk glove factory for some time and would like to know the amount of cloth it should take to make one dozen of 23 in. plain gloves, size 7½, and the same for plain short gloves, both in tricot and milanese cloth?

(5232)

The yardage of cloth necessary for one dozen pairs of 23 in. plain gloves, size 7½, and for plain short gloves, is as follows: The long gloves require about four square yards per dozen pairs, while the short gloves will require about 2.3 square yards per dozen pairs. Since dies vary considerably, one style will vary from another and the gloves of one manufacturer

may differ from those of any other. Generally speaking, the same yardage is required whether the fabric is tricot or milanese.

Licker-in Speed

Can you advise me as to the best speed for a licker-in that is running on single carding, 1¼ in. staple cotton, carding a 9 oz. lap, and has a cylinder speed of 165 R.P.M.? I would like to know the average speed for licker-in on this grade of cotton. (5231)

If you consult the trade catalogs you will see that for a cylinder speed of 165 R.P.M. the speed that is suggested for a 9 in. licker-in varies from 425 to 457 R.P.M. In one very successful mill, known to the writer, where the material handled is about the same as yours, the licker-in speed is given as 455 R.P.M. These appear to be the usual speeds now in force for most work. For longer staples still slower speeds have been used and the writer has heard of a licker-in speed as low as 320 being used on such cottons.

Holes Made in Boarding

We are having an exceptionally large amount of damaged hose as shown in the few stockings which we are enclosing. We have watched carefully and have noted that the holes break out during the boarding operation. We are writing to find out if you can advise us what this is due to. Any information that you can give us would be greatly appreciated. (5224)

The evidence presented by the damaged hose suggests that you are using forms in your boarding department which have rough spots. When the boarder grips the hose to turn the seam into position the fabric is rubbed over these spots, cutting or partly cutting a number of stitches. The weakest of these stitches then break open when the stocking is pulled to give the desired length. We would suggest that you have all forms thoroughly examined and rough spots smoothed down with fine emery cloth. If too deep for emery to be effective have your mechanic fill the spots in with soft solder and smooth the solder down with emery.

We are taking it for granted that you do not permit your boarders to wear rings of any kind while working. We have known quite a few cases of damaged hose from this cause. A

sharp blow from a ring on the hand of a boarder will do considerable damage; even a plain hand ring will cut a silk hose when it is stretched on the form.

Cutter's Waste

I would like to know the following points:

(1) The usual normal percentage of waste made in cutting in the cutting room, when shirts and drawers and union suits are being cut in about equal dozens or quantities of underwear; in the derby or ribbed cutting room?

(2) The same in the balbriggan cutting room?

(3) The same in the fleece cutting room, but in this room underwear is being cut and also sweater coats in about equal dozens. Can you give the percentage on underwear separate from the sweater coats?

I am desirous of obtaining what ought to be the normal or usual percentage of waste in these departments in a mill that is being efficiently managed. (5220)

There are three sources from which this waste comes: First, from ends of rolls of cloth; by using more care in fastening rolls together in bleaching, dyeing or napping, some saving can be made. Second, imperfect cloth from holes in the fabric caused by bad yarn, bad knitting, or from stains or holes torn in the cloth during the different processes of manufacture. Third, waste due to the shape of the cut garments, which depends on whether they have straight or sloped shoulder, curved or straight arm holes.

The per cent of waste may depend upon the care used by the cutters. This is sometimes influenced by the way they work, whether by the dozen or the day. Goods can be cut with less waste if cuffs are sewed on sleeves and ankles of shirts and drawers or union suits. A good grade of wool or worsted yarn should make a better fabric than cotton yarn. Cotton carded yarn will not give as good results as combed yarn. Two-ply always runs better than single.

In reply to (1), it is the writer's opinion that 11 pound shirts and drawers made from a good grade of carded yarn, sloped shoulder and cuffs sewed on, should not show waste of over ¾ pound per dozen, and 17½ pound union suits from same fabric not over 1½ pounds per dozen. This is a liberal allowance. By using a nice yarn and plenty of care throughout the

different processes of manufacture, the amount may be reduced some. Waste can be saved if the cutters are allowed to put imperfect cloth into second garments.

In answer to (2), it is the writer's opinion that from 6% to 7% would be an average allowance for waste on balbriggan underwear.

Referring to (3), it is generally expected that fleece cloth will make up with less waste than ribbed cloth and therefore garments of the same weight should show less waste in this fabric than in derby rib. The sweater coats, if cut with sloped shoulders and straight sleeves, from good cloth, should not show as much waste as shirts and drawers. If the waste on shirts and drawers is estimated at ¾ pound for an 11 pound garment, the waste on sweaters of the same weight should be a little less than ¾ pound. If the sweater weighs more than 11 pounds the waste would increase in the same proportion as the sweater increased in weight.

Cotton Warp, Artificial Silk Filling Fabric

We enclose herewith sample showing all cotton warp with artificial silk filling; the silk being cotton fibre base. We are interested in finishing the fabric wet in order to eliminate reed marks, etc.; also in using a softener which would eliminate the "boardy" feel now obtained, both to be handled in such manner, however, as would conserve the present luster of the goods. We would appreciate anything you may do for us in the above matter. (5205)

We doubt whether the boardy effect can be eliminated from this fabric by simply using a softener. The goods might be boiled out in the open width on jiggs or through a 4 or 5-compartment boiling-off machine. Such goods usually require from 30 to 40 minutes' treatment in the open width with a high grade of soap to remove the sizing material and give the proper soft handle. It may be possible that by passing this fabric through a continuous boiling-off machine, consisting of 5 or 6 compartments, with not less than two compartments of boiling soap, followed by two water rinses and a final cold rinse, that the boardy effect will be eliminated.

If the writer were treating these goods to eliminate reed marks he would be inclined to pass them through a diastafor treatment, let them lie two to four hours in trucks, afterwards boiling off through machine above mentioned. This would

soften the goods down considerably and the luster would still be retained. If additional softening were required in the finishing it is very easy to add a softener to the finishing material before the goods are run over tentering frame.

Hosiery Shrinkage

Enclosed please find two stockings, one as knitted and one dyed. They are both size 9½. We have had several complaints from customers that this stocking, after being washed, shrinks entirely too much. We believe that the stocking shrinks in the toe and heel, which is 80/2 mercerized yarn. We will appreciate it very much if you would be kind enough to let us know what your opinion is as to the cause of the shrinkage. (5198)

There is nothing in the hose to show an undue shrinkage; neither do we think that laboratory tests will show any reasons for more than customary shrinkage. However, corrections should be made in knitting as the foot is too short for size 9½. The foot should set naturally on a size 9½ form when dyed, and should fit a size 10 form in the gray, just as it comes from the knitter. This allows ½ inch for shrinkage. We are returning the dyed sample with the heel marked to show how it should appear when properly made. With the corrections suggested there should not be any further complaints.

Yellow Stains on Underwear Fabric

We enclose a sample of cotton knit underwear fabric which has been scoured in a 1% olive oil soap bath, temperature around 150 deg., rinsed in one warm and two cold water baths. Every once in a while we get a batch which has yellow stains through it like the sample, and we are wondering if you can help us locate the trouble. (5203)

The yellow stains appear to be soap suds scum. This is deposited on the cloth in different places as the olive oil soap bath is drawn off after scouring, and is not washed out by the hot water rinse, so that when you finally give the cloth the cold water rinse the scum is set. On drying, the yellow stains appear. The prevention of such stains is a matter of care in running off the scouring liquor so that none of the suds will settle on the cloth. Keeping the cloth in motion is one good way of eliminating this trouble. Whenever you are running off

any liquor, whether the soap or rinse waters, keep the cloth turning in your washer until all the liquor has run out. This yellow stain can be removed by a hot water soap bath and a good after-rinse.

Drying Mercerized Yarns

We would like you to give us information on the following questions: (1) After yarn is mercerized, soured and washed, is it advisable to dry quickly or slowly? (2) What is the actual weight of skeins for mercerizing 50/1, 60/1, 50/2, 60/2.

(5200)

(1) It is advisable to dry the yarn at once, but not too rapidly; that is, not too hot. The ideal method would be to spread the yarn out thin and let it dry under the ordinary air conditions. This is not often possible, but the nearer one can come to it the better. This method favors the "feel" and the retention of the proper amount of moisture or "condition." In practice run as low a temperature as possible and still get the necessary production. Evenness of drying is especially important if the goods are to be dyed.

(2) Skeins weighing 2½ to 3 ounces, with 3 inch tie-bands, that is, bands that will allow a spread of about 3 inches, are best. There is usually no advantage in running skeins under 2½ ounces, while larger skeins are more trouble to spread evenly on the poles of the machines, and are less likely to give even results, both in mercerizing and in souring and washing.

Short Nap on Chinchilla

We are mailing you today a piece of chinchilla cloth which we have experienced some difficulty in finishing. This cloth is scoured and dyed in the regular way. Upon napping we are unable to get a high nap as the wool seems brittle and breaks very short. We understand this wool has been in the knitting mill for about three years. Two years ago we dyed the same wool and experienced no trouble with same. Could it be possible that this wool has become brittle enough to give us this trouble? This cloth is knitted on spring needle machines with green soap as a lubricator. We would appreciate any information that you might be able to give us regarding same.

(5199)

Advice from one of the leading knitters of cloths like the sample puts the entire blame on improper care of the wool

while in storage. This authority states that the stock has lost a large part of its "life," making yarn that is hard and brittle; which results in the short nap in finishing.

Sizing Mercerized Warps

We are contemplating using mercerized cotton warp, and not having had much occasion to look into this subject would appreciate some good information as to the methods of handling mercerized warps. For instance, just how are they slashed, what size ingredients are used, if any, how much heat is carried on the slasher, and so on. We are going to use about 30s single yarn, 2400 ends, 76 sley, 72 picks, on a loom equipped with drop-wire stop motions. (5184)

There being 2400 ends in the warp you would most likely make four beams of 600 ends each. After this yarn has been beamed on section beams it is put in the slasher. The beams are placed in the creel in the regular way, two on the bottom and two on the top. They are then tied up and run over the machine and leased the same as if it were just plain cotton. The ends are then counted or laid in the expansion comb. The smaller the number of ends in a dent the straighter will be the warp when finished.

In making the size care must be exercised in getting a formula that will give the best results. Experiments must be made right in your own mill, on your own particular goods and with your climatic conditions. We will give a formula which you may use as a basis to work from, increasing or decreasing the amounts according to your particular requirements. A kettle of 150 gallons capacity can be used. Fill about three parts full of water, put in 75 pounds potato starch, 15 pounds of a good grade of gum or dextrin, 4 pounds tallow or the equivalent of a good brand of softener and then fill until about 4 in. from the top with water. This should then be allowed to mix for fifteen or twenty minutes before turning on the steam.

After this has been done the steam can be turned on full until the mixture is boiling quite hard. Then the steam should be turned down low enough so that the contents will not boil out of kettle and boiling allowed to continue for an hour. The size is then ready to use. For ply yarn this mixture could be reduced with water in the slasher size box to about one-half its original strength.

From eight to ten pounds of steam ought to be sufficient. Care must be taken that the yarn is absolutely dry, but it must not be burned in drying. Important as slashing is, it frequently is regarded as of minor importance and does not receive the attention it should. The damage caused by errors in judgment or carelessness of the overseer or operator oftentimes extends through considerable of the product before correction can be made. We always contend that to cut expenses down too close in the sizing department is false economy. For we must admit that a large percentage of the weaving is in reality done right in the slasher room.

Worsted Yarn Unevenly Dyed

I enclose a skein of 1/17s dyed worsted yarn. You will observe that in short lengths this has taken a much lighter shade. Certainly it appears like a dyer's fault. We have had samples dyed by four different dyers and all have the same defect, so it hardly looks as if the dyers were at fault. I cannot account for anything in the yarn that would cause the trouble and would be very grateful for any information you can give me on the matter. (5178)

The undyed portion of the sample skein of blue dyed yarn submitted consists of pure wool not unlike the remainder of the skein. It does show, however, the appearance of not having been well scoured at the places where it is imperfectly dyed. There is a possibliity, on the other hand, that the hanks are tied too tightly, which would prevent the proper circulation of the dye liquor at that part, and therefore less dye would be taken up by the wool where it is so tied. Without any other facts before us, or even a full sized skein to examine, this seems to be the most likely cause of the trouble. It is really due to poor manipulation rather than to poor dyeing.

Testing for Amount of Oil in Wool

Could you advise me the best way to make tests for the amount of oil present in wool, tops and worsted yarns? (5209)

The most accurate way of determining the amount of oil is by extraction with ether or other suitable solvent. This, of course, is an analytical process and requires special appartus. Any mill that maintains a laboratory would most naturally have

this equipment available. In brief, the process of extraction is carried out as follows:

Weigh the amount of wool, tops or yarn taken; approximately a 10 gram sample is placed in a Soxhlet extractor connected up with suitable condenser and the material allowed to extract for at least 8 hours. The extraction flask is removed from the extractor, the ether distilled off and recovered. The extraction flask containing the residual oil is then placed in a drying oven and heated until constant weight is obtained at the temperature of boiling water (212 deg. F.) The weight of oil divided by the weight of top or yarn taken gives the percentage of oil.

This analysis should be made on bone dry material. By this we mean the tops or yarn should be dried to constant weight before extracting with ether, and this weight used in calculations.

Why Crepes Shrink After Washing

Can you tell us what would cause dyed crepe de chine to shrink after washing? (5214)

The creeping, or shrinking in, of crepe de chine and similar fabrics so that the surface will present a granulated, or "pebble," effect is accomplished by hard twisting the filling yarns which are used. When woven in the cloth, the natural gum of the silk still remains in this filling, as well as such soap and oil as has been added by the throwster in his soaking bath. Therefore, there might be perhaps 23% more or less of this gum, soap and oil which will be boiled-out of the goods in the dyeing if the silk is white. If the silk is yellow there will be 3% or 4% more gum in the material.

After the twist has been put into the yarns, and they have been steamed to prevent them from kinking, the cloth is woven and no tendency to shrink is shown in the raw goods. When the fabrics are entered into the boiling-off bath, in which process the gum is boiled out of the silk, the gums gradually soften under the influence of the boiling water and soap, and as they soften kinking begins to take place, with a consequent contraction in the width of the goods. When all the gum has been boiled out, the full amount of contraction that is permitted by the twist of the silk, and its size, will have been attained.

Following this boiling-off there are subsequent operations of dyeing and finishing which it is not necessary to detail here. The point is that the amount of shrinkage that is made possible for the goods by the particular twist and size of the silk, and the number of picks per inch, should bear a proper relationship to the finished width desired. Thus, if the goods were laid 43 inches wide in the loom, coming out in the gray somewhat narrower than that, and were intended to be finished 39½ in wide, it would not do to have a contraction of the fabric in the boiling-off operation to just that width, for if the goods were then taken out and finished they would be very irregular looking, and would not have the smoothness desired. The goods, in regular practice, shrink in to a substantially narrower width than what they are intended to be when finished. This width might be about 38 inches, more or less, for goods that are to finish 39½ in.

In the finishing operations they pass through what is known as a tentering frame, which is a machine in which they are stretched out while drying. Previous to this a very slight gumming will have been given to them which assists in preventing the goods from shrinking in any after leaving the tentering frame. The idea is that they will be just enough narrower than the finished width to permit of their being stretched out to a smooth and true condition when brought to the proper finished width.

Too many manufacturers give little thought to the contractile power of the filling materials that they are employing. The more picks there are to the inch (so long as they are not so close as to bind each other) the greater the contraction. The larger the size of the thread for a given amount of twist, the greater the contraction. The larger the amount of twist for a given size of thread the greater the contraction. The less the amount of warp threads whose resistance is to be overcome in the shrinking in, the greater the contraction. And the converses of these will, of course, give a lesser contraction. And yet manuafcturers will take exactly the same silk, and use it in fabrics with differing numbers of picks per inch, and with variable numbers of warp threads per inch, and expect to get the same contraction in each case.

The consequence is that a very large portion of the crepe filled goods that are manufactured have been made with yarns that possess too great a contractile power. That is, they have

such shrinking power that, even after they have been boiled-off and stretched out to their finished width, there still remains in the threads a large amount of unexpended shrinking force. This is the reason why manufacturers frequently find pieces of goods that they have in stock narrower than when they received them from the dyers. Goods received 40 in. wide may, as the weeks pass by, be found to have shrunk in gradually to 39, 38, 37 in. or even less in width. This is due to the unexpended twist in the threads forming kinks, one here, one there, one the other place, as the days pass, with each one aiding in the contraction of the goods.

With reference to the exact point raised in the question as to why crepes shrink after washing, the answer is that the goods themselves, when made, had too much contractile power remaining in the filling yarn after they were finished and which, at the first opportunity, would come into action. The fabric, owing to the slight stiffening put in by the finisher, might retain its width in the piece, and also during its manufacture into garments but when, in the washing, this finishing would be removed, the goods would then shrink in according to the unexpended shrinking power remaining in the filling.

The fault, of course, lies squarely on the shoulders of the manufacturer, either for lack of knowledge of the factors in the case, or lack of care in seeing that such matters are properly attended to.

Wavy Pile on Cotton Velour

We are enclosing herewith samples of cotton velour. You will notice the pile is wavy; it is cut in the loom. We have been weaving this cloth with ¼ in. length pile, and had no trouble. The pile was cut clean without showing any waves. We have shortened the pile about 1/16 of an inch and added two picks, and now we have this trouble. (5189)

From our examination of this material it seems as though the cutting knife on the loom is too dull and should be sharpened, as the pile has the appearance of being torn rather than cut. Also it may be that the pile bars on the loom are not adjusted properly for this height of pile. The inquirer states that the height of the pile has been changed and should change the position of the pile bars accordingly. These are the only suggestions which we can make from the samples submitted.

Weaving Leno

Will you give me information on the enclosed sample of leno? How many harness; what kind of doups and how are they tied; how does the slackener work? (5157)

The sample of leno sent would require eleven harness levers, although it could be woven with nine if the capacity of the dobby were limited. It would be advisable to use eleven levers as follows: 2 levers for one set of worsted doups; 2 levers for the selvage harnesses; 2 levers for the ground harnesses; 4 levers for the doup ends or figuring harnesses; 1 lever for the slackener. The slackener operates on alternate picks (on the cross shed) when the doup and standard is up on the left-hand side of the ground ends. The doups are tied to the doup harness on what is termed right-hand, that is, the loop in the doup should face to the right when the doup and standard are level.

Uneven Filling Flush Twill

I am sending you a sample of cloth 43 inches, 3.50 goods, 68 by 96, made out of 29s warp and 36s filling, woven with three harnesses up and one down. What do you think of this cloth? You will note the cloudy places running fillingwise. It seems to be uneven. Could you advise us any way to weave twill cloth without this cloudy appearance being in the filling? Please note the places I have marked with pencil on the cloth. (5181)

The cloudy places are caused by the use of very uneven filling. No particular setting of the loom would eliminate these cloudy places but the writer would like to know if there is any particular reason why this cloth is being woven face down, or three harnesses up and one down. It is customary to weave filling flush twills or sateens with the face up, or three harnesses down and one up.

There are two reasons why mills will continue to weave filling flush twills or sateens with the face down. One reason is because of a lack of filling flush cans; the other is that if a spring top head is used the weaving of these cloths with the face down relieves the strain on the springs. The spring top head is suitable only for the weaving of warp face sateens or twills.

It is very poor economy to use the warp face cam for the weaving of filling face cloths of this type. When they are

woven face down the weaver cannot see imperfections on the face of the cloth and cannot easily match the pick when the filling is exhausted. The loomfixer cannot see if the face of the cloth is uneven. Better results can be obtained if the correct cams are used for the weaving of sateens or twills. A top roll motion is better than the spring top motion but the spring top is easier to handle. The motion of the spring top is jerky. The top roll motion is easier on the yarn and the harnesses for it gives a rolling motion and when once set correctly will give less trouble than the spring top motion.

The face of the cloth in question could be improved some if the proper equipment was used but the cloudy places could not be eliminated unless a more even filling were used.

Length of Yarn on Bobbins Per Doff

Please give me the following information:

(1) How to find the length of the pick on a spinning frame from the size of the heart on Scaife lifter motion. How to measure a heart so as to find the length of the traverse motion.

(2) Does every bobbin on the same side of a spinning frame have the same amount of yarn on per doff if there are no breaks? I made tests and found that there is quite a variation in yardage of various bobbins from the same doff, which I cannot explain, as the diameter of the front roller should be the same in every part of it. Can you explain this?

(3) If, for example, I have 13 turns of twist in 2/24s yarn and the front roller turns out say 5000 revolutions per doff, having a diameter of four inches and making 34 revolutions per minute, what amount of yarn will I have on the bobbin, if there are no breaks? Will it be the same amount as the front roller turns out or less on account of inserted twist, and how many per cent. less from the original length? Is there a rule for this? (5188)

Question No. 1 is answered fully in Priestman's "Principles of Worsted Spinning," pages 188 to 200 inclusive, and Bradbury's "Worsted Preparing and Spinnng," Vol. III, pages 762 to 789, inclusive. This really requires an analysis of the Scaife motion and consequently would require drawings, calculations and attendant explanations, which are given in the books mentioned. They can be obtained from the Book Department of TEXTILE WORLD.

Referring to question No. 2, variation in yardage upon bobbins from the same side of machine can be caused by:

(1) Breakages.
(2) Uneven pressures upon top rolls.
(3) Top rolls not all the same diameter.
(4) Fluted rolls full of grease.
(5) Slight variations in diameter of the bosses on fluted rolls.
(6) Variations in the hardness of top roll leather covers.

Taking up question No. 3, the contraction in yarns due to twist is dependent upon:

(1) Quality of wool used.
(2) Counts of single yarns.
(3) Turns per inch in single.
(4) Turns per inch in plyed yarn.
(5) Direction of twist in single and plyed yarns.

There is no rule which can be safely used to determine the contraction. Usually a spinner has to increase his draft, to produce the counts desired from a certain weight of roving, due to contraction of the yarn.

In twisting it is easy to ascertain the counts of the single and twisted yarns. If two ends of 1/24s are twisted together and actually tested out, by careful weighing, to be equal to 12s counts, there has been no contraction due to twist because the twist taken out of the single has compensated for the twist inserted in the plying process. Suppose that the twisted yarn weighs out to equal 11 3/4s counts this would be positive proof of contraction due to twist.

80 yards of 1/24s weighs 41.67 grains
80 yards of 2/24s weighs 85.1 grains.

$$\frac{85.1 \text{ grains}}{2} = \text{weight of one single end in twisted yarn.}$$

$$= 42.55 \text{ grains.}$$

If 80 yards = 41.67 grains
X yards = 42.55 grains

$$\frac{(42.55)\ (80)}{(41.67)} = 81.7 \text{ yards}$$

Percentage of contraction

$$100 - \frac{(100)\ (80)}{(81.7)} = 2.1\%$$

This calculation can be simplified because there is a relationship between the weight of 160 yards of single and the weight of 80 yards of the twisted yarn, comparable to the ratio between 80 yards and 81.7 yards.

160 yards of 1/24s = 83.34 grains
80 yards of 2/24s = 85.1 grains
Actual counts of twisted yarn = 2/23.5s

Contraction due to twist

$$100 - \frac{(83.34)\ (100)}{(85.1)} = 2.1\%$$

Thread for Mending Hosiery

Will you kindly advise what you think is the best thread for mending silk hosiery, both in the gray and after being dyed in different shades? (5175)

It is customary to use for mending, silk of the same thread that is used in the knitting. A small amount is usually left on the cones after knitting that is put aside for this purpose. In the case of dyed shades a small amount of yarn to be used for mending is dyed with the hose.

Uneven Worsted Yarn

I am enclosing sample of 60s top and a yarn spun from same. The yarn is 2/36s. If you will inspect the yarn you will find it very unevenly spun. We have had complaints about the yarn from the weaver and rightly so. I would be grateful for your opinion on the matter. My opinion is that the unevenness is due to excessive short fibre in the top which it is impossible to control. The rovings are even, so I think the drawing can be left out of consideration. Ratch in spinning 5½ in. (We have tried the ratch down to 4½ with no better results); draft 4. Carriers as close to the front rollers as possible. Roving on the hard side to try and control short fibres with the twist. Even with 16.5 turns of twist in spinning the spin was very bad. We tried with less twist in spinning but results were even worse. For months we have had nothing but very bad spins from this top. Somehow or other I can't get it out of my mind that there is excessive short in the top, and that the spinning properties are not there. We have tried all weights of rovings, ratches, twists and different degrees of humidity, all with the same results. We use a double headed bobbin on 2 in. cap. We have tried 1¾ in. caps and certainly we get a

little better result. We also tried spinning on to a filling or shuttle bobbin and still we had a bad spin. I would be very glad if you could give me any advice in the matter. I would be particularly pleased for your opinion regarding the top. The bad spins referred to above apply mainly to 40s counts, though in this particular case the spin was very bad on 36s. The spindle speed is 6500. (5190)

It is a very poorly conditioned top and has practically no oil in it. It would help to apply olive oil or a good emulsion in the gilling. The stock measures about 7 in. long and should make a nice roving. The yarn is uneven, probably caused by short drafting in the spinning. It should have about 6 draft or between a 70 and 80 grain roving to spin from. The ratch depends on length of stock after it is put through drawing. The ratch is usually set about the length of stock, or a shade under.

The speed of your frame is too fast. It should be about 5,700 for this stock, with 16 turns of twist. High speed is probably the worst cause of the trouble. Be sure your divider tins are clean; also pot eyes. If you keep close watch you will find that your cost will be about the same as you will make less waste and better yarn. The top is a shade on the low side for 2/40s, but should spin fair.

Loss in Weight and Width in Bleaching Sheeting

A bale of gray cotton sheeting weighing 773 lbs., containing 920 yds., of 90 in. cloth, goes in process in the bleachery. This width is finished 81 in., a loss in width of 10%, and gains in length 46 yds., of about 5%. Will shringage account for the balance of the loss in width? Enough starch is put in goods after bleaching to offset the mill sizing but we find a loss in weight of anywhere from 10% to 15%. How is that loss in weight accounted for? What does it consist of and is there any method of reckoning loss of weight when bleaching cotton cloth or raw stock. (5176)

There is no definite method of reckoning actual loss in weight from the bleaching process on either cotton cloth or raw stock. The figures given seem to the writer to be excessively high so far as the loss in weight is concerned. This may be accounted for, however, by the fact that the gray goods were weighed at a time when they were carrying their full standard of hygroscopic moisture, or about 8%, and the finished weight

may have been taken when the goods were practically bone dry and before they had been given any opportunity to recondition.

The inquirer states that enough starch was put in the goods to offset the loss in weight resulting from the mill sizing being removed. The writer cannot understand just how this amount of weight could be added in a practically pure finish as per the sample submitted. The gain in length is about the average on work of this class, as such should run from 5% to 6%, where a loss of 10% is allowed between gray and finished widths. Another fact to be taken into consideration is that aside from the sizing material used in the weaving, the bleaching process removes a certain percentage of natural waxes and foreign matter grown with the cotton.

Summing up, however, it seems that the loss in weight is excessively high, at least 5% more than usual, and we would recommend that the inquirer look into the question of how much cloth was removed in cutting out seams and bad ends before the finished weight was taken.

Yellow Stain on Bleached Drill

Enclosed please find a sample of two-yard drill that has been finished and bleached but is all yellow in the center. Now to the best of my knowledge it was all perfectly white when it left the bleach house and was dryed up on the cans before it was starched, but after it was starched and finished there was this yellow streak all down the center. If possible I would like to find out if you can say just what the cause is. As far as I know the bowls on the starch mangles are all in good order, the top one being rubber and the lower one brass. The boss starcher says it is mill oil, but I really think otherwise. I have an idea he has the wrong mixing in it and is trying to pass it off on the other fellow. We are not on very good terms and if you will submit a mixing that you think will overcome this trouble, I think it will be better for everyone concerned.

(5183)

The goods do not show the effect of a very satisfactory kier boil and seem to be a type of white which will not be permanent. Upon holding up the sample of goods to the light, the center seems somewhat cloudy, indicating that there is still a certain percentage of foreign matter in certain places in the goods. This could be caused by improper circulation of the kier or poor boiling in the kier, and again through the use of

an open width saturating machine if diastafor is used, upon which the pressure had not been applied evenly.

The main feature which impresses the writer is the fact that the filled side of the goods is decidedly off-color. This could result from the use of dirty water in starch mixing, or some of the ingredients used in the filling being off-color. If the starching is the actual cause of the complaint it may be possible that the doctor blade of the Tommy Dodd mangle is not in true alignment, allowing more filling to go through on to the center or middle of the goods. There are so many details involved in trouble of this kind that it is impossible to cover this inquiry accurately without an inspection of the work in the plant.

Bright Cotton Selvage on Indigo Dyed Goods

We have found difficulty in getting a cotton selvage to show bright and clear in an indigo dyed range of self stripes. The selvage colors desired are orange and red. Can you advise grade of cotton to use and what dye; also whether mercerized cotton would help keep the selvage bright? (5171)

We assume that this is a piece-dye proposition, in which case there will be some difficulty in securing cotton yarns dyed the desired shades that will retain their brilliancy through the dyeing as well as the finishing operations. If the cloth is to be made with indigo dyed stock, a more general method, then the problem is to wash the indigo dyed material so completely that there will be no free indigo remaining to stain the cotton threads. We doubt whether a mercerized cotton yarn will materially aid in keeping the color bright.

Finishing Black Silesia

I am enclosing herewith sample of black silesia and would greatly appreciate a formula to produce the same effect; also the manner of procedure and the machinery required to handle this class of work. (5155)

These goods, after dyeing and drying, are very evidently starched over a 2-roll starch mangle with either wood and brass rolls or rubber and brass rolls, with a formula containing approximately 30 to 35 pounds of white corn dextrine, 20 pounds of 50% turkey red oil or some other well known

softener, and necessary black tint to color the starching material. This sizing material, when cooked, should be enough to make 100 gallons.

After starching, the goods are dried over a cylinder drying machine and run over a 40 ft. long automatic clamp tenter with a steam box on the entering end to even up the width and assist in throwing up the twill. From here they are conditioned and allowed to stand for two to four hours, given one run on a 3-roll friction calender with the lowest amount possible of friction on the rolls in use, and with a temperature on the chilled iron roll which is not too hot. In fact, it may be possible to get this finish with the roll nearly cold. After running through the calender the goods should be ready to make up for the trade.

Dyeing Woven Felt

We have a customer who is interested in dyeing a woven felt, known as piano cloth. The characteristic of this felt must be that the dye is only on the surface of the cloth, and that the center is left a clear, solid, well defined white. The color used is universally scarlet and we understand that cochineal colors are the most successful. Our understanding also is that this material is dyed in the open width by passing continuously through a dye bath and then directly into a cold water rinse in order to set the dye and stop further penetration. If you can give us any information regarding the method which has been found practicable, or any data concerning the strength of the dye, the temperature, the time of the goods in the dye liquor, and in fact, anything else about the process which you think would interest us and our customer, we certainly would be deeply indebted to you. (5186)

It is doubtful if the surface dyeing of piano felt with cochineal is practiced. The reason for this opinion is based upon the fact that, as a dye for textiles, cochineal has long since ceased to be employed. Its place has been taken by the coal-tar "cochineal scarlets," a group of dyes that are much more readily applied to wool, and at the same time possess equal brilliancy and fastness.

Since the propsosition is to dye only the two surfaces of the felt as quickly as possible, so as to prevent the dye working into the middle, it will be seen that both the density of the felt (i. e., degree of felting) and strength of the dye bath will be important factors to consider. With a dense felt, only

a short immersion in the hot dye liquor will be necessary. The dye bath will be charged with the necessary amount of dyestuff for the desired shade, together with glauber's salt and a little oil of vitriol. The passage of the felt through the dye bath must be quickly done, or else some of the dye will work into the central portion of the felt and color it.

A large trough with two immersion rollers, and one upper guide roller should be sufficient to handle the felt in a proper manner. Since no two felts are exactly alike so far as density is concerned, it will be best to make preliminary trials regarding strength of dye, temperature of bath, and time of immersion.

Elastic Web Shrinks

We have had complaints from one of our customers concerning the shrinking of elastic after it had been wet and dried again. We have performed experiments to verify the customer's complaint and found that our elastic does shrink from four to six per cent. in length by wetting and drying it again in the air of the room. We have experimented with elastic that has been calendered and some not calendered and the results are practically the same.

Our customer suggests waterproofing the material but we know of no practical way to do this. He further suggests pre-shrinkage. This we have tried without good results. We are sending you, herewith, a sample of our elastic as we ship it to the customer and would be pleased to have you suggest methods to eliminate the above mentioned shrinking.

(5187)

In weaving or braiding elastic fabrics, the various strands of rubber threads are, of course, run into the goods at a very high tension, being stretched to five or six times their normal length. They are only restrained from returning to their original condition by the covering of cotton warp and filling. These stretched strands of rubber are continually exercising their power of contraction so long as the outer covering of the fabric has less strength of resistance, and up to the point where the two forces of contraction and resistance become equal. This point is generally determined by the ordinary uses such fabrics are generally put to, and provision is made in finishing the goods to anticipate these conditions. Shrinkages are governed accordingly when finishing the goods.

The liability to contraction after finishing varies considerably of course according to the relative difference in the two forces operating against each other. The finer and weaker the rubber, and heavier the covering, the less becomes the liability to shrinkage. This may go so far that great care has to be exercised in finishing such goods in order even to maintain the shrinkage desired. So, likewise, if goods are constructed with a liberal amount of rubber warp woven or braided under high tension (as in sample submitted), and are to be subjected to a use different from the ordinary, where the outer warp covering is to be softened by wetting and its power of resistance to the power of the rubber warp is weakened, then of course it will become necessary to anticipate such unusual usage by special measures.

The best way to do this is to subject the goods to a process of shrinkage before finishing, commensurate with the uses they are afterwards to be put to. Then be careful to maintain the same relative shrinkage while finishing. The method generally employed when such unusual conditions are required is to first shrink the goods as much as possible by a bath of live steam as they are entering the finishing machine. This is best accomplished by having a copper steam chest constructed the width of the machine cans and about 12 in. deep, and allowing about 24 in. for the goods to travel through the live steam. This gives sufficient time for penetration and shrinking. A cover is made for this steam chest, having a pitched roof so as to allow for the condensed steam to run down its sides, where it is caught in a small channel or trough so formed that it will carry the condensate to the sides of the box where it is discharged to prevent any water from dripping on the goods as they are traveling through. Just under the cover, slots are arranged so as to guide the goods through the box in proper position. In this manner they are shrunk almost all that is possible, after which they are immersed in the size bath before passing on to the drying cans.

The size bath should be constructed so as to pass the goods over a roller on entering the bath, under another roll at the bottom of the bath, and over a third roll on leaving. These should be well centered and travel easily, so that there is not the slightest drag on the goods. Otherwise the goods may be stretched a little when passing on to the drying cans and shrinkage may again take place after finishing. A steam heated

pipe should run through the bottom of the bath so as to keep the liquor at a uniform temperature. The goods, which have already been subjected to a softening process by passing through the steam chest, will only require a relatively light size, as the size will penetrate the fabric more thoroughly than if the goods had entered the size bath in a dry condition.

The drying cans should not travel any faster than the speed at which the goods are delivered from the size bath, otherwise they will be stretched when drying and then of course will be liable to shrinkage later. It is well to have the finishing machine constructed so that the delivery end of the machine can be speeded somewhat slower than the entering end. This is accomplished by having all the cans in one half of the machine geared independently of the other half, and the two halves connected by a belt driven from cone-shaped pulleys. The belt is equipped so that it may be shipped by a hand screw device for varying of speeds. To further safeguard any liability to shrinkage after finishing, arrangements should be made to travel the goods a considerable distance over rolls between the two differently speeded sections of the finishing machine. This will remove all possibility of further shrinkage and the goods are finally "set" by passing over the slower traveling cans.

Bleaching Rayon Stripes

Will you please advise us if artificial silk stripes and checks woven in cotton piece goods can be successfully bleached with caustic soda and liquid chlorine, and handled on a regular 2-roll washer? (5182)

A great many concerns, in fact the most successful bleachers and finishers, are processing artificial silk stripes and checks in cotton piece goods through a bleach with caustic soda and either chemic or chlorine, but they are not using a regular 2-roll washing machine. Goods of this type will not stand the harsh treatment through a bleach house washer, and a great many concerns have found it to their advantage to use slack washers of light construction, with one reel instead of two nip rolls. Some concerns have installed what is known as the tank system, or the Bennett system, where the goods are washed from the kier into wooden tanks, and the chemic and souring operations accomplished through circulating pumps, allowing the goods to lie in one position during the two pro-

cesses and having water connections on the tanks so that the goods can be washed down between each process by simply flooding the tanks.

Finishing Artificial Silk Ribbon

We are manufacturing a ribbon of cotton warp and artificial silk filling, a sample of which is enclosed herewith. This ribbon, as you will notice, is quite harsh as it is delivered from the loom. We would thank you to suggest to us the type of machine to use and also a method of finishing that will retain the luster of the artificial silk but reduce the harshness.
(5152)

The brittle harshness of feel associated with artificial silk products similar to the sample submitted is very apparent when compared with the soft feel of similar products when made from pure silk. This fault may in a great measure be improved by proper finishing, but great care has to be exercised in maintaining the high luster which is the main characteristic of artificial silk products, and also in being careful to avoid giving the goods a yellow tone. Corn, potato or vegetable sizes of any kind should not be used.

A small finishing machine of three or four heated cylinders is advisable, regulating the heat to the lowest temperature practicable to dry the goods. The drying process should be somewhat gradual so as to avoid liability of baking the light application of size on the surface of the goods and yellowing them. The cans should be nickel plated in order to avoid any liability of dirt accumulation on the face, and in order that they may be easily kept clean and bright. The size should be applied by running the lower nip roll (which should be of rubber) in the size bath. In finishing the goods, first pass them through a light steaming process, then through the nip rolls, the lower of which will carry enough size from the bath for distributing on the goods. Let the first heated cylinder be covered with a soft absorbent cloth, which will prevent the size from drying on the surface of the goods too quickly.

A very light size should be used, made from gelatine of the very best quality obtainable. This being transparent it will not in any way interfere with the lustre of the silk. Add a little soluble oil when making up the sizing to give the goods the desirable softness of hand. Regarding proportions of ingredients to be used, this of course depends largely on conditions

required, and may be best determined by experience, but an initial batch might be made of say ¼ lb. of gelatine to the gallon, adding ¼ pt. soluble oil, then regulating according to the results obtained.

Blue Bender Cotton

Have you any records from which you could extract some information regarding blue bender cotton, showing the extent of its production, that is, its percentage of the whole cotton crop, and perhaps also the principal uses to which it is now put, and the difference in price between blue bender and other grades? Information on this subject would be most welcome and we thank you in advance for any trouble to which you may go on our account. (5166)

As no one grows blue bender cotton intentionally and as its color is supposed to be the result of soil and weather conditions, the quantity of such cotton produced varies very decidedly from season to season. According to the best advice that we have been able to obtain, it might range from a few thousand bales one season to as many as 10,000 or 15,000 bales another season. As you probably know, the source of blue bender cotton is largely in the bends of the Mississippi River and its tributaries, and although authorities differ as to the exact cause of its color there appears to be general agreement that it is largely due to the character of the soil. Some hold that the color may be accentuated by wet weather during the period of lint formation, or by frost.

Owing to the difficult bleaching properties of blue bender cotton it is used principally in yarns and fabrics that are to be dyed dark colors or for goods in which light and bright colors are not essential. At present prices of cotton blue benders might be expected to sell 6 to 8c lower than a middling to strict middling grade of 1 1/16 to 1 3/16 inch cotton.

A Kink for Napped Goods

It has occurred to me that you may be able to solve a difficulty we are having with our bath robings. We make various patterns and colors in bath robings and have considerable trouble in covering the warp yarn in our napping process on the dark colored patterns. We would appreciate very much any remedy or suggestions you may be able to give us through your questions and answers columns to elimate our troubles. (5162)

We can relate what was done to overcome a similar condition at a mill where the writer worked a few years ago. We ball-warped the yarn and sent it to the dye house where it was dyed a sort of mouse-gray color. Then we beamed it again for the slashers. We found that the cost of this process was high but it gave us a better piece of cloth so we continued it for a time. The superintendent and the writer were talking it over one day and it was suggested that we try tinting the yarn on the slasher. We did and it came out very good, so we bought a small second-hand size kettle of 120 gallon capacity and mixed the color and size together. We put one pound of direct black dyestuff into a 16 quart pail of water, boiled it until the dye was all dissolved, then filled the size kettle one-half full of water and put in the dye liquor. To this we added 75 pounds of corn starch, 1 pound of tallow and 10 pounds of gum, and boiled the mixture for one hour. The slashers had two size boxes and two cylinders. We ran the yarn through one box and then through the other, and over the two cylinders. When the yarn came through the slasher it looked almost as good as the dyed and beamed yarn and it served the purpose just as well. The superintendent stated later that they did not have to run the cloth over the nappers as often as formerly to cover up the white yarn and it made a much better piece of cloth.

Artificial Silk Waste on Wool Cards

Can you give informaion as to what success can be had in handling artificial silk waste, like sample enclosed, on woolen cards, so as to condense a yarn 15 to 24 grain for 12 yards? What clothing would you use? Is any special care needed to rub? (5163)

The chief difficulties experienced in running artificial silk waste on woolen cards are generally with the condensing, the fancy and the rings. The clothing is of secondary importance; in fact, ordinary or medium clothing such as used on regular woolen cards should give satisfactory results, other conditions being favorable. The open set straight tooth fancy will give good results when run at the proper speed, which should be no faster than necessary to properly clear the cylinder. The tumbler should be speeded faster than customary in order to clear the stock from the leader.

The rubs should be run fast with a short stroke (rather than set down too hard). Twenty-four rings per doffer, 1 inch in width, are preferable to the narrow rings for this class of stock. Dividing fingers should be arranged between the rings to break the long fibre. The stock should be thoroughly dampened with a good emulsion which will keep the material from flying during carding and also assist in the rubbing.

Breaking Needles

We find in running 60 worsted and 80 cotton on our flat knit spring needle machine, 20 needles to the inch, that needles snap off and stay in the fabric as per sample enclosed. Will you please give us your opinion as to the cause and remedy for this? (5158)

You may be pressing the needles too hard, but the needles are too brittle and we recommend that you send them back to the needle maker and have them drawn in the section where the breakage occurs. Needle makers have facilities for such work. With proper conditions it would be a rare thing for a needle to break as in the case of your sample.

Brown Stains on Bleached Worsted Yarn

Enclosed herewith two skeins of 2/30 worsted yarn which has been double bleached. You will note that the material has some brown stain on it which occurred some time during the process of sulphuring. They are not drips from sulphur house roof. Would appreciate your examining them and telling us what causes this stain. (5159)

The cause of the stain could be one of many things. With a more detailed description of your process we might indicate directly the cause, whereas with the limited information on hand we will have to assume several conditions. Were the stains located at the top or bottom of the stick? Are the skeins sulphured after the soap bath with no rinsing? Is there any dripping in the sulphur house? Do you have fans in the sulphur house?

Answers to the above questions would locate your trouble with certainty. There are of course many other causes for brown stains in bleaching woolens or worsteds, but the nature of the stain on your sample precludes any but those dependent on the foregoing questions.

If the stains were located at the top of the stick, it would mean that the skeins are extracted too dry, or too wet, or there is not enough ventilation to distribute the heat generated by the burning sulphur. There must be moisture present in the material or the sulphur fumes will have no bleaching action. It will therefore be readily seen that should the top of the skein be dry, or nearly so, the degree of bleaching will vary, leaving a dull or brownish stain at the top. Should the skeins be too wet, the water dripping to the bottom will cause uneven bleaching.

Now we come to the most likely cause of the stains, namely, soap spots. It is usually the custom to soap woolen or worsted skeins after peroxide bleaching, allow to drain, hydro-extract and then place in the smoke house. Should your water be the least hard, precipitated soap will become attached to the material and when smoked will produce a brownish spot. Furthermore, sulphur fumes will precipitate soap from its solutions, hence the bottom of the skein, due to dripping, will contain practically all the excess water, and therefore considerable soap which being precipitated by the sulphur fumes, will cause stains. As a matter of fact any spot in the skein which is wet with a fairly strong soap solution when the sulphur fumes hit it may produce a brownish stain such as complained of.

A thorough rinsing in cold water to remove the sulphur fumes, followed by a good soaping, will remove the stains. To prevent the stains rinse thoroughly after the soaping (after peroxide bleach) and then extract so that there will be no dripping when placed in the sulphur house. If your water is hard, soften by the addition of either soda ash or phosphate of soda, or better still, install water softening equipment.

Winding Under on Mules

Will you please offer us recommendations or suggestions as to how we may overcome under winding of yarn spun on old type mules? (5164)

There are several things that can cause the trouble of yarn winding under on the mules mentioned. In the first place the faller chain may be run too high by the spinner, allowing the yarn to wind too slack, or the quadrant arm may be set too far from the vertical, thus not turning the spindle fast enough at the beginning of the wind, which would cause the yarn to wind too slack on the bottom of the bobbin.

The mule may be backing off too far,leaving too much slack yarn at the start of the wind. The two center tracks may not be level, or there may be a low spot in the track at some point as a result of the floor having sunk. Or the weight on either side of the center carriage wheels may not be evenly adjusted, allowing more weight or pressure on one side than on the other, which is often the cause of the trouble in question.

Drawing-In From Three Beams

We are going to receive some fancy cotton dress goods warps from our slasher room with three beams to be drawn together for one warp. The ground warp will have 2322 ends of single yarn. One of the fancy beams has 266 ends of single yarn and the other beam has 64 ends of novelty yarn. Could you give me any information on how to have these arranged for the drawing-in girl in the most convenient manner?

(5165)

We assume that you have the ordinary drawing-in frame with brackets on the back to hold the single beam warps. It would be advisable to have some four-wheel trucks made to fit the width of your beams and slots cut in the uprights for three beams, one above the other. Also have brackets on the top cross bar to hold the harness and reed when the warp is drawn. The warp can be put on the truck and pushed up close to the frame. When the warp is drawn the whole job can be taken away from the frame and pushed right to the loom without any extra labor or cost for handling. The warp will be kept in good condition for the weaver.

In regard to arranging the beams for the drawing-in girl, the ground warp should be in the bottom slot of the truck and the yarn should come off from the top side toward the girl. The next beam should be the 266 end beam and this ordinarily should pull off from the bottom. If this beam should happen to be a silk or artificial silk warp, it should pull off from the top the same as the ground warp. The novelty yarn beam should be on top as it has the smallest number of ends and it is easier for the weaver to put his hands through if he has to. This beam should pull off the same as the 266 end beam.

The drawing-in girl will now take the comb from the bottom or ground warp beam and hang it up in the usual manner, brushing all the ends down tight. Then she should take the comb from the next beam, the 266 end one, pull it over the

ground warp and place the comb underneath the first one, the yarn from this comb lying on top of the other comb; then brush the ends down tight the same as on the ground warp. Now she should hang up the stop motion rods with drop wires. After this has been done she should take the ends from the novelty beam and lay them right on top of the stop motion where she can reach each end easily. There being only a few ends on this beam it is very easy for the girl to get an end when she needs it. When the yarn has all been drawn in the stop motion or drop wires, put the harness and reed on in the regular manner.

Streaks in Silk Hosiery

The enclosed stocking (10 thread silk) has crinkly streaks about one inch long running crossways around the leg. These appear after boarding but clear up when reboarded. Please examine carefully and advise how the trouble can be overcome. (5145)

The streaks are caused by the boarder in attempting to put all the stretch in the stocking at one point. To do this he is compelled to grip the hose too hard, causing a puckering of the fabric and as his fingers pass over these puckers the streaks are formed. They are removed by reboarding because the wetting they are subjected to causes the stitch to assume its natural position and the hose, having been already stretched, does not need to be pulled hard enough to pucker under the boarder's fingers. The boarder can prevent this by properly placing the foot and heel on the form before gripping he body of the hose to stretch it, then gradually allowing his hands to slip down the length of the form, instead of trying to stretch the entire hose from the fashioning as has been done in the hose submitted. It would help the boarder if the hose were whizzed a little more in the extractor before leaving the dyehouse.

Fleecing Knit Fabric

Please tell us how to improve upon the fleecing of the fabric which is herewith enclosed? (5144)

There are a number of ways by which the fleecing of knit fabric like the sample submitted could be improved. The first and easiest method would be to nap the cloth before put-

ting it through the bleaching process and then nap it again after bleaching. The finish looks rather uneven, indicating that the clothing on the napping machine was worn out. The life of napper clothing is estimated to be from one to two years of continuous wear, depending on the fabric being handled. It would be well to submit this problem to manufacturers of napper wire as they might have a wire better adapted to the work. If the needles would permit the use of a heavier yarn, and a slightly looser stitch were used, the nap could be made more satisfactory as the fabric would be softer after bleaching. When a heavier nap is desired it is customary, as far as possible, to increase the speed of the bent wire and slow up the straight wire, which will hold the cloth longer on the machine and give a better finish.

An underwear mill man replies to this question as follows: Better fleecing of the fabric can be done by making certain that your wires are all in good condition, and that your cylinder does not revolve too rapidly. The sample submitted has all the appearance of being napped with either poor wires or with the cylinder revolving too rapidly, or under both of these conditions.

Knitting Rayon From Cones

I would like to ask how to run artificial silk from the cone on spring needle machines, or whether it is practical to do so. The kind of goods I wish to knit with artificial silk on spring needle machines from the cones is underwear. I would like to know how to get moisture in the material and how to prevent it from ballooning. (5123)

In knitting artificial silk from cones the yarn package should be set on a thick, soft cloth pad with a hole in the center large enough to allow the large end of the cone to pass through. This is so that the contact will be between the pad and the lower end of the silk package itself. The arrangement prevents any of the silk which happens to loosen up and drop down from working under and between the wound silk and the stand or floor.

The ballooning of the thread as it runs off the cone is an advantage rather than otherwise if it is properly controlled. If the first guide or eye is placed just the right distance above the cone the ballooning will throw the thread away from the cone as it unwinds and in this way tend to throw the yarn out

from under any knots on the side of the cone. These knots are one of the principal troublemakers in the knitting from cones.

As to getting moisture in the silk, if the goods are scoured before being made up, fairly good results may be obtained by using any good oil. If, however, the goods are not to be scoured the thread should be steamed. This is usually done by piping up each knitting table with steam pipes, with a nozzle for each feed. The thread passes through a jet of steam just before it goes to the needles. Considerable care and ingenuity must be used in designing these nozzles in order to get the dry steam to the thread without water, as water is harmful to the best results.

After the above reply had been printed a reader sent the following:

Referring to question 5123, it is indeed practical to knit artificial silk from cones on spring needle machines, but the artificial silk must be lubricated with an oil in order to take the harshness or stiffness out and prevent it from curling; also to make it possible to knit without breakage to the needles. The best grade of neatsfoot oil obtainable is the best material to use on the artificial silk. The neatsfoot oil should be of a cold test of 20 and the free fatty acid should not be above 5 to 8%.

I know of some concerns that add gasoline to the neatsfoot oil; others combine it with a very good grade of light spindle oil. This is done to give the oil better penetrating properties. But whenever these are added special precautions must be taken in the scouring process. E. N. P.

Dobby Skips

Enclosed find a piece of tissue gingham. You will notice that the filling lies on top of three warp ends at different places all the way across the cloth. These defects do not occur regularly; sometimes they are only a few inches apart, at other times they are a few feet apart. I would like to know what part of the loom would be most likely to cause this trouble and what can be done to remedy it. (5161)

The defect is what is termed in weave room parlance a dobby skip. It is caused by the knives of the dobby missing one or more of the hooks, which could not have been in proper position. On inspecting the sample very carefully we note

that it is one hook that always misses the knives. The general causes of this trouble are worn or stuck parts about the dobby levers, hooks and knives. Very frequently one may find a loose or short peg in the pattern chain. The defect can also be caused by an ill fitting bar in the chain, or by chain links which have become stretched. Dobby levers and hooks which bind in the head very often cause this trouble. Possibly the dobby cylinder is not properly timed and the hook, being a little higher than the others, missed the reciprocating knives. As stated above, it seems to be one hook that is missing all the time, due to its not being in its proper position, or on account of a short peg or a peg fitting loosely in the pattern chain.

Specks in Union Goods

We are, and have been, experiencing an epidemic of specks in our goods, as you will see by the enclosed sample. In this cloth we use all carbonized shoddies with wool and sulphur black cotton for carrying stock. We have tried various blends, each time eliminating a certain grade of shoddy, until we have covered the full number of grades used in our stock, and in no case have we been able to place the blame on any one stock or any one carbonizer.

Some of the specks you will notice are cotton all pilled up, and we have tried various ways of mixing so as to allow absolutely no oil or emulsion to touch the cotton. We have tried various grades of cotton, one grade of which is enclosed, before and after carding on a card which had just been ground, the main cylinder of which is 60 in. diameter, 74 R.P.M., clothed with No. 32 wire. There are nine 6-inch workers, 8 R.P.M., clothed with No. 32 wire, set to 32 gauge; fancy 10 in. diameter, 463 R.P.M., clothed with No. 30 wire, open set, low bend; doffer 30 in. diameter, clothed with No. 32 wire, 8 R.P.M., set to a 28 gauge.

Is there anything you can suggest that will benefit us at this point? How should mix be laid down, using 10% of cotton, to avoid wetting, and positive consequent pilling? The writer is under the impression that the sulphur black has bled in the finishing, for if some of the gray specks are picked out they will be found to be black where imbedded in the cloth. Is there a chemical whereby sulphur black which has gone gray can be restored in the washer or dye kettle after washing off? I am under the impression that such a treatment was used in a mill where the writer worked when they made cross dyed cotton worsteds.

Any information you can give along any of the lines mentioned above will be greatly appreciated by the writer, and the various overseers and executives connected with our plant.
(5160)

The trouble with specks that is so noticeable in the sample of cloth does not seem to come from the cotton pilling on the card. The larger specks are caused by some form of foreign matter in the cotton, like leaf, and are noticeable in both samples of cotton, uncarded and carded. The most practical method to follow in mixing cotton with wool, to prevent the oil from coming in direct contact with the cotton, is to oil the wool stock first and run it through the mixing picker. Then lay the lot down, putting a small amount of cotton on each layer of the wool. By following this method there is no danger of the cotton getting wet to the extent of causing it to pill in carding.

There is no chemical with which sulphur black dyeings on cotton can be treated that will restore the full shade of black as originally intended. What this correspondent probably has reference to is an oxidizing process with some sulphur blues. Some such blues can be increased in intensity by carefully oxidizing with the aid of perborate of sodium or even with peroxide of sodium. If a sulphur black does not come up to the full shade in the dye kettle, there is small chance of its being brought to its full intensity by treating it in the washer.

Mercerizing Goods with Artificial Silk Stripe

Can you give me the correct process for mercerizing and scouring cotton goods with an artificial silk stripe?
(5132)

Successful results are being accomplished by taking the goods after singeing and treating with diastafor, then washing and mercerizing in the gray condition through 54 Tw. caustic at a temperature of not more than 55 to 60 deg. F., preferably 50 to 55 deg. if this can be obtained by a simple cooling device.

Caustic impregnation is accomplished through a regular 3-roll padding machine with two or three immersions before the first nip and two or three after the first nip. The goods are run in a continuous process onto a 60-foot mercerizing tenter and sprayed on the last two 10-foot sections with cold water. The first washing compartment after the tenter should be about 120 deg. F. and the next washing compartment cold

water. The third compartment should be a lead-lined sour tank, and a composition of sulphuric and hydrochloric acid as a souring mixture is preferred, about ¾ to 1 deg. Tw. The final two compartments should be cold water washes. The goods are then ready for the regular kier boiling and bleaching process. The mercerizing process above mentioned should work at not more than 40 to 45 yards a minute for high grade work.

Holes in Knitted Fabrics

From time to time in the past we have experienced considerable trouble with small holes in our knitted fabric, and while we have had our own ideas regarding the cause of these holes, later events have made us question their accuracy. These holes do not appear always in fabric made in the same machines, or from the same yarns. They appear first after the fabric has been through the washing and bleaching department and before it is put on the drying spreaders. Our first thought, therefore, was that the holes occurred during the washing, bleaching or extracting processes, but we are unable to locate any cause in any of these machines which would indicate the origin of the holes. We have also worked on the theory that the holes might have been made in the take-up rolls of the knitting machines, but here again we can find no cause. If you can throw any light upon this subject, it would be appreciated. The cloth in question, which we are forwarding to you, was knitted from 40/1 C.P. cotton on our 14-cut machine. (5115)

The hole is not a tear but is a decided cut of the yarn, therefore you must look for any sharp object which would tend to cause this. In any bleaching process the cloth goes through in a rope form, therefore the holes would appear irregularly and on both sides of the cloth. The holes when cut on the knitting machine are hard to locate, and only show up when being dried, as there you have a spreading action which opens them up and makes them visible. If the kiers should have any scales upon their inside walls and a piece of this gets into the cloth, upon the cloth passing between rollers, such holes would be made. We would suggest that upon finding a roll with holes in it you thoroughly inspect the knitting machine. If future rolls from this machine show no holes, then go to your next machine and inspect this, and so on through the entire works.

A knitter replies to this question as follows: The cuts without doubt were caused by the fabric coming in contact with metal. A good way to solve the trouble would be to take rolls from knitting machine, roll up over larger spreader than size calls for, mark roll after looking over and send through washing, bleaching and dyeing. When dry, roll up again for regular size. In the meantime have cutters keep a record of rolls cut and holes.

The writer has been through the above so much that holes don't even get a good start. The cutters will take it up themselves and sometimes catch the trouble before the day is over. I run single 40 C.P. on 14-cut, with about 70 frames, and believe I have had all the usual trouble and then some. A needle dropping in and going through the take-up rollers will leave a rough or sharp point that cuts a stitch or two and will not show unless spread out. A spreader will bump back and forth if too loose, and leave a string of cuts if too tight. A new hand on a spreader can cause all sorts of trouble unless he is carefully instructed. The knowledge of tight and loose spreaders is of first importance to any lightweight mill. If rollers are used to pull cloth from an extractor, look them over.

Tangled Dyed Skeins

We are sending you a skein of yarn in which you will find the thread entangled. There is continual dispute between the spinning master and the dyeing master as regards this. Each one denies that the fault is his. Of course in examining the yarn in its gray state, we have not been able to find entanglements of such a nature, and what we shall thank you to let us know is whether it is due to bad handling in the dye house or whether it is due to some other cause. (5110)

This inquiry is from a mill in Ceylon. Since an examination of the yarn before it is dyed does not show any indication of its being tangled, and the entangled condition appears only after dyeing, we are inclined to regard the trouble as occurring while it is passing through the dye bath. We are not informed as to the method of handling this yarn, but comparing it with similar yarns dyed in this country and having had the opportunity of seeing how badly they tangle by a combination of indifferent workmen and excessive steam blowing into the kettle, we believe that a similar situation exists where this yarn was dyed.

To overcome this kind of tangling use should be made of modern dyeing machines, in which the hanks are hung on sticks that hold them in a reasonably taut condition while they rotate in the dye liquor. Again, it may be that this yarn could be dyed without any mechanical injury by adding a small, though sufficient, quantity of soluble oil to the bath, and working the skeins or hanks from poles by hand. To us it seems to be a dyer's problem and not one for the spinner.

Bleaching Artificial Silk and Cotton Hose

Can you advise us if there is some simple but effective method of bleaching artificial silk and mercerized cotton hose in vogue in the United States? This work is at present carried out for us by an outside firm of dyers, but the process they use has a tendency to turn the artificial silk yellow or creamy. In addition, the cost to us is heavy, and we desire therefore to obtain, if possible, a formula which, with due care and attention, could be worked by what we may term amateurs.

(5170)

There are many firms using chlorine for bleaching artificial silk hosiery, and many using the so-called peroxide method. The first requires more care and the chances of damaged goods are greater; on the other hand it is probably the less expensive process. The investment in equipment is much less for the peroxide bleach than for the chlorine bleach.

It is practically impossible to obtain a pure white on viscose silk, but there should be no trouble in obtaining a white that is satisfactory to the trade. As the peroxide bleach seems to give less trouble with this class of material, it will be described in detail.

Boil the hosiery for 1½ hours in a bath containing:

6% soap
2% soda ash

Rinse twice with warm water and once with cold water. Allow to drain, or better hydro-extract, then enter into the bleach bath prepared as follows: To every 100 gals. of cold water add 5½ lbs. sulphuric acid, 66 deg. Be., and approximately 4 lbs. sodium peroxide. Stir well and test with both red and blue litmus papers. Neither should turn color. Should the red paper turn blue add enough more acid so that a red paper immersed will not change its color. Should the blue paper turn red add enough more sodium peroxide so that the

blue papers immersed will not change color. At first this part may seem a trifle difficult but after a little practice you will find it simple. When neither paper changes color add 4 lbs. sodium silicate 42 deg. Be. Stir well and enter the goods, at the same time turn on the steam. Raise temperature to 160 deg. F.

By bleaching overnight steam is saved as only enough steam is then used to raise the temperature to 160 deg., after which it is shut off, and the goods pulled the next morning. Or by maintaining a temperature of 160 deg. F. a satisfactory bleach may be obtained in three to five hours, depending on the degree of white desired.

Of course a lattice-work top must be placed over the goods to keep them immersed (if a vat is used). Should you use a rotary machine for bleaching, the above chemicals must be mixed in a 50 gallon barrel and then poured or allowed to flow into the machine. An overnight bleach cannot be used in this machine. After the goods are bleached sufficiently, soap for 45 minutes, using 2% soap. Give two warm rinses and one cold. Should the water not be clear, give more rinses. A tinting will improve the appearance of the material.

Silk Cuts in Worsted Fabrics

We are running on fine fancy worsteds made from warp and filling of 2/40s worsted and 60/2 silk, and are having trouble with silk being cut. The cloth leaves the weave room all right, for we can find no silk cut on the grease perch. But after it is washed and fulled it shows the silk cut for ¼ in. in places. Then again, from the same style, same warp and same loom, the cloth will come perfect. Now if the trouble is in the weaving department why should one piece be cut and the next perfect? My theory is that the silk is dressed tight and separates in the finishing. We have drop wires on all warps so it can't be threads out, and if it were it would show on the grease perch. (5135)

It is essential that the silk threads be dressed slacker than the worsted because they weave tighter and are more liable to break down; they are also likely to cause slight wrinkled effects. Your theory regarding the cause of trouble may be correct or it may only be a contributing cause. The trouble may be due to putting the silk threads into the reed dents as extra threads. Thus the dents containing silk are more crowded than the others and the threads in these dents have not as

free action as they should have. We advise you to make sure that the silk threads are reeded on the same basis as worsted threads. It does not seem possible for the finishing process to cut the silk as shown in the samples.

Air Stains on Knitted Web

I am sending you two pieces of knitted web which are yellow stained. It is only recently that we experience this trouble and we cannot find the cause. The stains do not seem to be rust as they can be washed out easily. I shall be much obliged if you can give us any information to overcome this trouble. Could they be air stains and what is the cause and prevention of them? (5122)

These are air stains. They can be washed out with cold water, but are removed much more easily with warm water. They are caused by parts of the cloth drying out, usually before extracting, a yellow streak or half ring appearing. This can be prevented by wetting down in case the cloth has to stand over night, but the best preventative is to extract the cloth just as soon as possible after bleaching.

Caustic Saturating Machines

We would appreciate it very much if you would advise us if you know of any knitting mills or bleacheries that are using rubber rollers in their caustic saturating machines. (5169)

The use of rubber-covered rollers in connection with caustic saturating machines has proved very satisfactory, particularly in cotton piece goods bleacheries, both on machines used for saturating goods in the rope or strand form and for saturating in the full or open width.

For machines of the rope or strand type, which usually average about 6 ft. on the face of the rolls, it is the custom when using rubber-covered rolls to equip same with the bottom roll 14 in. to 16 in. diameter by 72 in. on the face, covered with ½ in. thick hard rubber covering, sometimes known to the trade as ebonite. The top roll is as a rule smaller in diameter, generally 12 in., and is covered with ¾ in. thick rubber of medium density. Rolls of this type are made with heavy wrought iron pipe bodies and are used on a large percentage of the new saturating machines built during the last four or five years.

The same applies to open width saturating machines, except that the two rolls are made the same diameter, which would be from 10 in. to 14 in., depending on the width of goods. An average can be struck on the following basis:

All widths of machines up to 45 in. should be equipped with 10 in. diameter rolls; 45 in. to 60 in. machines should be equipped with 12 in. diameter rolls; machines from 60 in. to 100 in. wide should be equipped with 14 in. to 15 in. diameter rolls.

The use of rubber-covered rolls on machinery for saturating or impregnating with caustic is, of course, not a new idea as all mercerizing equipment, both for piece goods and yarn, have for years been placed on the market with either rubber-covered squeeze rolls or rolls combining a series of iron and rubber rolls. You need have no fear as regards the use of rubber-covered rolls for saturating your knit goods as they are well worth the extra money, giving long service and cleanliness.

Waterproof Finish

I am enclosing two samples of cloth, one in the gray, the other finished. This material is 37 in. gray, 4.20 yds. to the pound, and is 36 in. finished. I should appreciate very much your giving me any information as to formula for starching and finishing this material. This cloth is classed as a single filled duck. You will notice that it is a very well filled piece of goods, also that the filling does not dust out in any way, and that it has a very soft and elastic finish. I should greatly appreciate any information that you can give me that will enable me to duplicate this finish. I may say in further connection with this that I understand that it is principally used in making curtains for shower baths. (5154)

Without being able to chemically analyze the goods, it would appear as though the cloth had been backfilled on a regular Tommy Dodd or backfilling mangle with a mixture containing about one-half the usual amount of starch contained in a backfilled mixture, loaded very heavily with paraffin wax and mineral ingredients such as talc.

To backfill in this manner the mixture would have to be kept very hot in the backfilling mangle, so that the paraffin wax would spread uniformly with the starch mixture. The writer knows of one well-known finishing concern turning out this class of material in waterproof finishes on which a white

pyroxylin is used with the filling. In this particular case the elasticity and waterproof effect seems to be obtained by the waxy ingredient.

Finishing Heavy Jean

I am enclosing herewith sample of sulphur-dyed heavy jean cloth, napped on back, and would appreciate information as to what would be the most practical way to finish this class of goods. (5133)

After dyeing and drying, these goods should be passed through a solution of 3% to 5% turkey red oil, 50% basis, by immersion in a 2-roll mangle or padder. Dry over a cylinder drying machine and stretch to width on a tenter, winding up on rolls. The goods would then be ready under ordinary circumstances for the napping process.

Knitted Fabric Stained by Oils Used on Yarns

We are writing you for information in an effort to solve one of the problems we are having in bleaching some of our fabric containing artificial silk. In winding this artificial silk, neatsfoot oil is used to make it run satisfactorily on the knitting machine. When we bleach and dye the fabric with this artificial silk in a string machine, the neatsfoot oil forms in a scum on the surface of the water. We tried to skim it off as much as possible but quite a bit of it clings to the goods and makes dark spots on the finished fabric. Is there any preparation we can use in our bleaching and dyeing tanks that will dissolve this oil and eliminate the trouble we are having? (5129)

The stains complained of have given considerable trouble where artificial silk has been used in the manufacture of knitted or woven fabric. This is especially true in localities where the water is hard. The conditioning oil must first be emulsified before it can be removed from the fibre. This is generally done by boiling out in a soap bath, but usually when the material is rinsed, after the soap treatment, the soap emulsion of the oil is precipitated in globules which are very adhesive and not readily removed from the fabric. Below is outlined a procedure which should enable you to obtain satisfactory results with this class of material:

Scour one hour at a boil, using 6% soap and 2% trisodium phosphate or 3% soda ash. Drain, and without rinsing, treat again with 2% trisodium phosphate or 3% soda ash. Boil one

hour and drain. Rinse with warm water and be sure to allow the rinse waters to flow over the top of the machine before draining. Proceed with the bleaching and dyeing as per your regular method.

It is very essential that the machine used be scoured and boiled out occasionally, as the grease becomes attached to it and naturally tends to loosen up and adhere to the fabric.

Silk for Single Weaving

I would appreciate it very much if you would be kind enough to give me your idea on the following questions: What size of raw silk is used mostly for single weaving? What fabrics are manufactured by single weaving? (5094)

As to the size of silk used for single weaving, this will depend upon the fabric to be constructed. The term, silk for "single weaving," refers to raw silk used for warp purposes in fabrics intended to be dyed in the piece, and where the threads are worked individually by the harnesses. The term, however, has been somewhat loosely and erroneously extended to include the raw silk warps for fabrics in which two or more ends work together through one heddle of the harness.

Some of the principal fabrics in which the warps are of raw silk, woven singly, are Cotton Back Satins, Liberty Satins, Bengalines, Poplins, Taffetalines, Crepes Meteore, etc. Very large quantities of Liberty Satin have been sold under the name of Satin Charmeuse in the last four years, and wrongly so, for Satin Charmeuse is properly made with an organzine warp.

Among the fabrics in which raw silk warps are used where the ends weave two together, or three together, are Crepe de Chine, Canton Crepe, Radium Taffeta, etc. Prior to the war, the silk most generally employed for warp for true single weaving was Grand Extra Yellow Italian 14/16 denier, and quite a little 13/15 denier was similarly used, with a moderate amount of even finer sizes. The very best silk obtainable was always demanded for this purpose. There was also a modest amount of the very highest grade White Japan silk similarly used in 14/16 denier, and 13/15 denier sizes. When the supply of Italian silk was cut off by the war, the Japanese took up actively the production of yellow silks. Yellow silk, on account of the greater amount of gum in it, is better for single weaving as, all other things being equal, the threads have more

coherence, and do not fray up so easily as do the white silks with a lesser amount of gum in them. Since that time there have been large quantities of highest class Japan yellow silks similarly used, the most of it probably being in 13/15 denier size, but the perfection of the reeling of the Grand Extra Italian has rarely been attained by the Japanese.

In fabrics where the face does not have to be of special fineness, large quantities of 20/22 denier are used. On account of the greater coarseness of the thread, there is less trouble in using white silk for this purpose than there would be in the finer sizes, and white and yellow silks are in this size used rather interchangeably. In Radium Taffetas, where three ends are used together, the size of 16/18 would be suitable; or where two ends are used together, the size of 24/26 denier. In Crepe de Chine and Canton Crepe 20/22 denier is the standard size, both white and yellow silks being used. In some goods, coarser sized silks such as 26/28 denier are employed, woven both single and double; and again, for the making of other goods, the 16/18 size will be used considerably.

JAMES CHITTICK.

Mildew on Wool Goods

I have some wool chinchilla pieces in the white which have been lying between the wash room and the dyehouse, and have got mildew stains on them. Do you know of anything I can do to take them out? (5143)

Mildew stains are difficult to remove when once they form. If it is definitely known that the stains are actually mildew, the only thing to do is to give the cloth a thorough scouring, and follow with a good wash to make sure that all the soap or alkali is removed. Then pass through a bath containing 1 to 1½ lbs. of oxalic acid for each piece. To this bath there can be added a small amount of muriatic acid. This suggestion is accompanied with the remark that no complete eradication of the stains is guaranteed.

Mildew when once established and discernible has already done its damage, and the damage cannot be made good. It is now known that scoured wool is always alkaline in reaction, and that mildew propagates rapidly on wool that is even faintly alkaline in reaction. This is what probably happened to your pieces between the wash room and the dyehouse. It is for this reason that indigo dyed goods often show mildew.

What are regarded as mildew stains, may, upon microscopic investigation, prove to be widely extended colonies of bacteria, working into, and disintegrating the fibre substance of the wool. The remedy for this may be passing the cloth through a bath of sodium bisulphite, acidulated with oil of vitriol, but only an experiment will determine the value of this treatment.

Dyeing Voiles

Can you give me a solution to the difficulty we are having in dyeing voiles. The selvages of goods after dyeing are darker on both sides of the piece, generally for about three inches in. This happens on all heavy shades, both on jigs and padder. The darker places show up after drying on the cans after dyeing. I have noticed when these goods are running on the mercerizing frame that the spraying pipes do not let any water on the selvages about two or three inches from the clips, and this part gets no water until it goes from clips into the wash box back of mercerizing frame. Could this have anything to do with the selvages being darker than the rest of the piece after dyeing? Should voiles be run from padder right to tenter frames or to cans? (5128)

The reader's deduction from his observation as to lack of water on selvages is correct. The effect of this is that at the selvages the mercerizing action is longer than on the rest of the piece and consequently the goods at the selvages have a stronger affinity for the dyestuffs and are dyed a deeper shade.

The best practice is to run the voiles from padder direct to frames, but in order to gain speed of production it will do no harm, to either finish or color, to partially dry the goods on a few cans at a low temperature, and then run direct to frames.

Sateen Changes Color

I am enclosing four samples of sateen lining, two marked "No. 1" and two marked "No. 2." I have experienced considerable difficulty with the samples marked "No. 2" on account of the color changing to a brown cast while under the hot iron. This is not due to excess of heat, but probably to some chemical which has been used in the bleaching process. Would you be kind enough to give me your opinion as to what causes the colors to change in this sample. The sample marked "No. 1" does not change. (5138)

The writer assumes that the samples were calendered at the finishing plant over machines with iron or steel rolls, heated

by gas or steam. If such is the case the change of color under the treatment with the hot iron is a rather surprising result. However it is recognized that there are certain colors used in the dyeing of such shades as pearl grays and slates, tans, etc., which are very apt to change to a reddish or brownish cast if subjected to prolonged treatment with heated metal. As a rule this is only apparent in the case where copper cylinders or brass tenter clips touch the goods under heated conditions.

It is possible that some starching or sizing ingredient has been used which may be acid and is responsible for the effect. It would be well to have chemical tests made by a recognized laboratory if the change of shade means a financial consideration of material amount to the inquirer. It is diffichlt to put one's finger on the actual seat of the trouble from a casual examination. Chemical tests might show the exact trouble very quickly.

Twill in Denims

We are weaving denims, some with a right-hand twill and some with a left-hand twill. Please inform me as to the principle of weaving that causes the twill to be so much more pronounced in the left-hand twill than in the right-hand, and also why the cloth is smoother and less covered with stray fibres in the left-hand than in the right-hand twill. I should also like to know why it is customary to weave white back denims with right-hand twill and double and twist denims with the left-hand twill. All of our denim is three leaf and drawn-in "front-middle-back." (5136)

Whether the direction in which the twill runs has any influence in the weaving, finishing or wearing qualities of a cloth is a matter of opinion, but in most cases the direction of the twill is from left to right, or what is termed a right-hand twill. This applies to the single yarn denims and is practically a standard.

What is meant by white back denims is a cloth in which the bulk of the white filling shows on the back, such as a two up and one down twill. Not all denims are woven in this manner; many of the heavyweight denims are woven with the two up and two down twill. In this case the filling shows equally on both sides of the cloth.

The writer does not know why denims that are made from the two-ply warp are woven with a left-hand twill but believes that the only reason for this is that the cloth can be graded

easily by those who handle large quantities. If some of the heavy weight denims that are made from single yarns should become mixed with denims of an eqaul weight, but made from two-ply yarns, it would be a rather difficult matter to distinguish the difference without having recourse to a pick glass. The difference in the direction of the twill shows at a glance which is the two-ply and which is the single yarn cloth.

It is reasonable to expect a more prominent twill on a denim made with two-ply warp in comparison with one made from single warp. When single yarn is twisted into two-ply this adds to the firmness and gives a more rounded and smoother thread.

The twist of the yarn, whether single or two-ply, would have some influence on the appearance of the twill. A slack twisted thread will lie flat; a well twisted thread will make a more pronounced twill line and show up smoother on the face of the cloth. A right-hand twist warp woven with a left-hand twist filling will not show as good a twill line as the cloth woven with the warp and filling of the same twist. This would be very noticeable on a three-leaf twill but would show little difference when weaving a two up and two down twill.

Shadiness in Sulphur Dyed Piece Goods

Your communication in answer to my recent inquiry (No. 5108) to hand, for which I wish to thank you. You ask for more details regarding the processing of this fabric, which I hasten to give.

We are not using copper drums, but iron drums covered with tin. The goods when taken from the bale are boiled out through a three-box washing machine, the first box containing caustic soda, soda ash and turkey red oil; and the two remaining boxes containing boiling water. The goods are dried, run through a three-roller padding machine and over the oxidizing rollers into the open wash boxes, consisting of five compartments; first two, water; third, after-treatment solution; and fourth and fifth, wash boxes fitted up with cold water sprays at each nip, with the exception of course of the after-treatment nips. The goods are then plaited down into a box and dried. We trust this information is more complete, and hope you will be able to give us further data on this matter. At the same time if you could send us a good formula for finishing these goods according to the sample we previously sent, we should appreciate the information. (5119)

The arrangement of machinery mentioned by the inquirer is in general the one commonly used by well organized dyers, but the process differs in one particular detail which, if corrected, would undoubtedly produce better work. The experience of a great many dyers of sulphur colors, particularly on khakis and olive drabs, has shown that the installation of a gas singer and the use of some detergent material in the immersion box of the singer for steeping the goods is highly beneficial, producing more even dyeing. If the goods have been allowed to steep for two or three hours they are simply washed through the three compartment washing machine, using warm water, and not boiled with caustic soda or other alkalis.

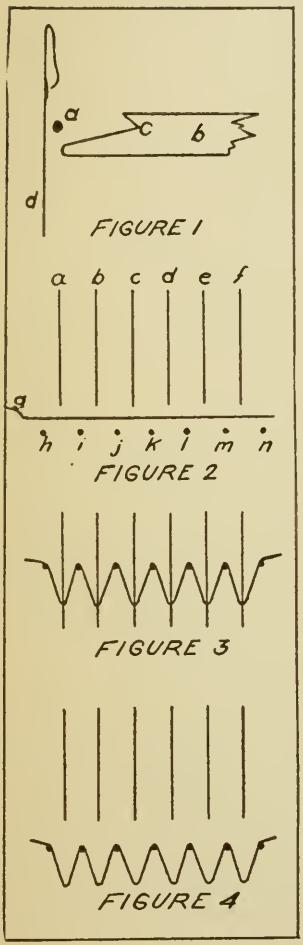
The writer is very familiar with a plant in New England which is producing on two sulphur dyeing ranges 75,000 yards per day treated in the above manner. Personal inspection of their work has shown it to be as near perfection as the writer ever saw on this class of dyed goods. Their finishing formula for a 100 gallon mixing seems to be 40 lbs. of white corn dextrine, 40 lbs. of thin boiling crystal corn starch, with the addition of about ¼ pint of carbolic acid and 2½ gallons of 50% turkey red oil.

The goods after standing and drying are run over a 50-ft. tenter with steam box at the entering end and steam coils to condition the goods and bring them out to width, afterwards calendered on a three-roll calender with two cotton rolls and a middle chilled iron roll used either hot or cold, depending on the amount of finish required. If the twill is wanted more prominent, the goods are calendered after starching with the steam box in front of the calender nip and afterwards tentered to draw up the twill and give the proper appearance.

The Remedy for Slazy Knitting

We are mailing you pair of ladies' full fashioned 42 gauge silk hose, showing defects in the fabric which we think have been caused by uneven tensions. We wish you to advise us concerning same. We are amateurs in the full fashioned business, having had only a limited experience. We are, however, familiar with the importance of gauging all machine settings, of sinkers and knock over bits, tensions, etc., but we have not been able to entirely overcome trouble as shown in sample. Any suggestion or suggestions you may be able to offer to eliminate the trouble will be greatly appreciated. (5237)

The stocking submitted showed evidence of what manufacturers usually call "slazy knitting." It is not caused by the tensions but by the condition of the silk at the time of knitting. While most manufacturers know how to clear up this defect, it is doubtful whether the cause is known or generally understood. Explanation may be found in the accompanying sketches:



In Fig. 1, b shows the usual form of sinker, and in Fig. 2, sinkers are represented at a to f. In Fig. 1, a is the yarn. In Fig. 2, the yarn is represented at g. It has been guided along the front of the needles h to n. (A needle is shown at d, Fig. 1). When the yarn has been placed as shown in Figs. 1 and 2, the sinkers are moved forward and the yarn is pushed by them between the needles, as shown in Fig. 3.

Of course the sinkers are not moved forward all at one time, as the yarn in that case would be cut to pieces. They are moved one at a time in order that each sinker may draw its full loop before the next sinker begins to draw. This is very important to know, because if a fixer should be ignorant of this fact, he might hunt all over the machine in vain to find the cause of cut holes in his fabric. If he should reason that the "slurcock" cam is causing the trouble and, after taking it out, finds it rough, he might grind it to such a shape that two sinkers would be drawing yarn at the same time. This would create a worse condition. (The "slurcock" cam passes along the jacks and by forcing them against the sinkers, causes the sinkers to move forward in the position shown.)

In Fig. 3, the yarn is being held forward by the throat of the sinkers (c in Fig. 1). Now, if the yarn or silk is of a hard

nature and has not absorbed the moisture (when it was wound damp on the bobbins or was, instead, passed through a moistening solution on the knitting machine), it will be "wiry." When the sinkers leave the loops for a brief space of time, as they do each course, the loops will not stay in the position shown at Fig. 4, but will "jump" from between the needles and, in so doing, break up the evenness of the loops. This will cause just the trouble shown in the hose submitted.

These statements can be very easily proved by taking a bobbin or cone which shows this trouble, "dipping" it in the silk solution for a few seconds, and putting it back on the machine. A few courses will show an astonishing improvement.

There are several good silk knitting solutions on the market. If the silk refuses to be conditioned by these solutions until it will absorb sufficient moisture to hold its position as at Fig. 4, it will be necessary to use a softer silk.

Finishing Upholstery Denim

I am enclosing herewith sample of upholstery denim and would appreciates it very much if you could get me some information on how to proceed to obtain the same finish as sample; also the machinery required. Is it the approved practice of plants handling this trade to give the cloth a full immersion through the starch or just starch on the back? (5113)

The finish of this upholstery denim is what is known as a "pure" finish; that is, after dyeing, the goods have been washed and mangled through a water mangle and dried over a cylinder drying machine. From here they have been taken to a regular 2-roll starch mangle, preferably one with a brass roll and a maple roll, the brass roll about 12 in. diameter and the maple roll 20 in. diameter. The starch mangle is a wooden starch box with a brass immersion roll set close to the bottom of the starch box.

The fabric is unquestionably given a full immersion through the starch and cannot be considered in any way a back-filled finish. It is difficult to give a formula for finishing this material without knowing more about the gray width and the finished width. If the goods are stretched back within an inch or so of gray width, of course the finish is broken down somewhat.

The sample does not show any selvage, but the goods appear to have been stretched on a tenter frame to a considerable

degree. The ingredients in the starch are unquestionably thin-boiling crystal corn starch and corn dextrine, with the addition of turkey red oil or some softening oil to keep the finish mellow and have it show no harsh effects from the starch.

Tie-and-Dye Effect

Can you please inform me whether there has been any process patented for dyeing a tie-and-dye effect on worsted yarns? Also have there been any tieing or dyeing machines patented for this process? If so, will you please explain the nature and workings of these patents? (5114)

We do not know of machines that have been patented for doing tied-and-dyed work. Evidently the reason for this is that machine work would destroy the particular artistic charm of hand tying. The dyeing, after the material has been tied, is done in an open kettle, manipulating the fabrics or yarns carefully by hand.

The nearest approach to machine tying is an appliance for holding taut the skeins of yarn so that the actual tying may be done with the least disturbance of the threads. Actual dyeing of the tied skeins or hanks is by working them over poles or sticks, as for untied skeins, but undoubtedly they could be dyed in rotary machines. The actual existence of a patent covering some feature of tied-and-dyed work is difficult to ascertain without an extended and thorough search of the records of the Patent Office, which we have not undertaken.

Setting Cotton Card

I am running ⅞ local cotton and my numbers are 30s warp and 42s filling. I would like to know what you think would be a good setting on the card. I want to clean the work as good as possible, and at the same time make the yarn as strong as I can. The following are my settings at present:

Doffer from cylinder..... 7/1000
Flats from cylinder..... 9/1000
Licker-in from cylinder..... 7/1000
Feed plate from licker-in.....17/1000
Licker-in knives from licker-in, just as close as I can get them. (5028)

The weight of laps fed the card may make it necessary to vary the setting a little at the back. Some of the above settings could be left as they are. If the work is not satisfactory with these settings, change to the following:

Draw the licker-in away from the cylinder, but not more than 10/1000.

Move the feed a little closer to the licker-in, but not closer than 10/1000 for a 12 oz. lap. If the lap is heavier than 12 oz., the setting may be rather more than 10/1000, varying between 10/1000 and 17/1000.

For the mote knives, a setting of 10/1000 to 12/1000 is customary. Where there are two knives set, the back one is 12/1000 and the front one 10/1000.

Comparative Sizes of Artificial Silk, Cotton and Worsted

Will you kindly tell me the sizes of cotton and worsted yarns that are equivalent to a 150 denier artificial silk?

(5149)

The following table which has just been issued by the Tubize Artificial Silk Co. of America gives the number of yards per pound of artificial silk of various sizes and the equivalent cotton, spun silk and worsted yarn numbers:

Deniers	Yards per pound artificial silk	Equivalent cotton, spun silk and worsted yarn sizes.	
		Spun Silk and cotton	Worsted number
50	89,291	106	160
60	74,404	88	132
70	63,779	76	114
80	55,807	66	99
90	49,606	59	88
100	44,645	53	80
120	37,204	44	66
130	34,342	41	61½
140	31,890	38	57
150	29,763	35½	53
160	27,903	33	50
170	26,262	31	47
180	24,803	29½	44
300	14,822	17½	26½

Marking Piece Goods

Can you advise us of any system whereby piece goods can be numbered or marked so that when dyed into black or very dark colors they can be located from these marks? The subject has been brought up to us in lots of goods going through, both dyed into black, both the same width, one counting 80/80, 9.00 yards to the pound, and the other 88/80, 8.50 yards to the

pound. They came out at the same time, and the tar marks that were put on them in the gray all covered over with the dye so that they cannot be seen, and we now have to count every piece to find which is which. We are at present marking the sewings with a sewing machine. We have seen some system whereby numbers are sewed on the pieces, or perforated insoluble tags are put in on the sewings when the pieces are sewed together, and we would like to know of any system like this. (5121)

There appears to be no better method of marking piece goods than branding with one of the tar and lamp black inks, or by stitching the lot numbers on the ends with medium heavy thread. Where the markings, as above applied, are lost during the dyeing operation, then recourse must be had to other methods. A mode of marking that might stand mill handling is to attach to the pieces large safety pins that are numbered and made for the purpose. Such pins are regularly used in garment dyeing establishments. They are heavy and well made. Another method for marking articles to be dyed is to attach small, perforated, waterproof tags. These tags are made of some sort of fabric that resists the action of the dye liquors, while the perforations showing the number remain clear and distinguishable. This seems to be what you desire. The tags and perforating equipment may be obtained from the Cummins Perforator Co., 261 Broadway, New York, N. Y.

The chemist at a large bleachery and dye works replies as follows: If the goods are to be dyed an aniline black, lot numbers may be stamped on by any of the following methods:

(a) Stamping ink made by mixing white lead and machine oil. After dyeing and chroming the lot number shows as a bright yellow lead chromate. We use this method with good results.

(b) Print the lot numbers on with a strongly alkaline paste which may be made from British gum and either caustic soda or soda ash.

(c) Zinc oxide resist made with 2 lbs. zince oxide, ¼ pt. glycerine, 0.1 lb. gum, 0.5 gal British gum, with enough water to make 1 gallon. The various ingredients are well ground.

I do not know, but believe that (c) would be suitable for aniline, sulphur, and direct blacks. The inquirer neglects to state what type of black he is dyeing. Usually the ordinary tar used for marking lots will show through blacks, even if

dyed a fast aniline black. If you have not tried tar, see what results you can get with it.

Fulling Polos

The writer would like to get some information on the following matter: I am finishing some all-wool polos, made of 100% tanners wool. In the fulling mill I am having difficulty in getting them up in length. Instead of shrinking in length, they gain in length. They go up in width better, but not as they should. Will you please advise me how I can correct this? (5104)

The fact that the finisher gains in length and the width is slow in fulling shows that the stock used has little or no fulling quality. The construction of this fabric is of much importance to the actual process of felting or milling and should be given due consideration in using the above class of stock.

The writer would suggest that more picks be added, making up the difference of weight expected from the shrinkage, and fulling the goods enough to soften thoroughly, working entirely on the width. In this operation run the work double draft in fulling to get quicker shrinking in width. A good heavy soap of the proper consistency will help considerably in the milling of fabrics made of wools with poor fulling qualities.

It is almost impossible for the finisher to shrink this class of work to get the desired results. The stock in itself is unsuitable to use to the extent of 100%. The only way is to keep the weight up in the loom, with as little fulling in the length as possible.

Bleaching Cloth Containing Artificial Silk

I would like to obtain your advice as to the best method of bleaching wools containing artificial silk stripe effects similar to the patterns that I am enclosing. We would like to be able to bleach this type of cloth without diminishing the luster of the artificial silk, and also without breaking the artificial silk, and are wondering just what outline of operations would be best for this work. Since the majority of the work has to be eventually dyed, it is also necessary to have the piece evenly bottomed and free of resists. The main features that I have noted on this type of work are that the less bleaching and handling the goods get the better the results obtained on the finished product. With this in mind, it all gets back to ar-

ranging the operations as simply as possible. I would like to ask the following questions:

(1) After singeing the goods, should the goods be diastafored to remove the sizing or run through an oil solution (either turkey red oil or red oil) to soften the goods before giving the cloth a boil (180 F.) in a Bennett kier with circulating pump and using either red oil soap or a compound like tetrapole for removing the fats from the cloth?

(2) What would be your idea of the most efficient way of removing the fats from the cloth?

(3) After the goods have been properly boiled off and washed, what would be the best method for bleaching the goods? (In asking this question I have in mind such points as type of bleaching agent and strength of same, length of time for bleaching, and finally the best method of washing.)

(5087)

One of the best known plants in New England finishing this class of work singes the goods and treats them with diastafor, afterward running through a bleach house washer with only one rubber roll. The goods are then loaded into a regular iron kier with motor pump and heater circulation, the liquor being heated through the well known multi-tubular indirect heater. A caustic boil of about 2½% is used with a 1% to 1½% solution of some well known kier oil which we believe is a tetrapole. They are boiled for 8 to 10 hours without pressure, the temperature not being allowed to go over 190 deg. F.

As regards question No. 2, it is believed that the above method will remove practically all the natural fats and waxes from the fabrics. Most people handling this class of goods seem to have the best results using soda chemic as a bleaching agent at not more than ⅜ to ½ deg. Tw., allowing the goods to lie in contact with the chemic for about 1 to 1¼ hours. We know of one concern that loads goods into the kier, saturating with a 2% solution of combination high grade tallow and palm oil soap after washing from the diastafor.

Curled Selvage

Enclosed please find a piece of our fabric which continually curls in the selvage and gives us unending trouble. We would appreciate it very much if you could advise us how to overcome this. (5124)

The cause of this trouble is in the construction of the selvage, which is woven tighter than the body of the cloth. The

remedy is to tack the selvages. The stitch should not exceed ½ in. in length to get good results.

Cut Combing

Will some worsted comber give me his definition of "cut combing." I have recently had to handle some imported 64s and 56s tops, and on looking them over I find what I term "cut combing." I have been informed that there is no such thing as "cut combing." My idea of how cut combing is done is as follows: Sliver too wet from backwasher; sliver too heavy for combs; comb rollers too near circles; holes in outside apron; dabbing brushes too low; too much twist in comb end going to coiler causing same to cut at first finishing box. I would appreciate it if any good comber would give his opinion of whether there is such a thing as "cut combing" and state whether I am right in my statement of how it is caused. (5101)

One worsted manufacturer replies to this question as follows: What they call cut combing is wool that has been cut in the comb. It is a common name among wool combers. It makes slubs in the drawing after it has been worked up and is one of the worst causes of slubs. All the things mentioned in the question will make it, and the worst offender is letting the comb run cold, with no steam on. Then instead of drawing fibres out evenly it will pluck them or draw unevenly. That breaks the stock and makes the sliver uneven. There may be another name for this but I have never heard it.

Another worsted manufacturer sends the following: Replying to your inquiry about "cut combing," this is known to the topmakers as "plucky combing" instead of "cut combing." This may be caused by such things as deep dabbing in the circles, bad drawing-off rolls, or close setting of the rolls, nickel aprons or holes in the aprons, wet sliver, or improper speed of the inside and outside drawing-off rolls. This same "plucky work" may also be made on the gill boxes by keeping the stock too deep in the fallers or bad front rollers and poor aprons. Also if the sliver from the comb was coming off hard twisted it would have the same effect in the finished top.

Soaking Silk

Referring to our recent inquiry (No. 5089), as to the trouble we have in soaking 20/22 japan hard silk, and your reply ad-

vising us to cut the temperature from 115 deg. to 85 deg., I am sending you detailed information as to the use and how we run this silk. We use a solution of 3½ lbs. of cocoanut grease, 2½ lbs. soap, to 100 gal. of water. In this we place 75 lbs. of silk in net bags and do not open skeins. We leave the silk in this solution all night and run it out in the extractor the next morning, and wind slightly damp. We have cut the temperature to 85 deg. as per your suggestion, and the silk seems to shake out much better this morning. We are running this silk on tricot machines. Thanking you for past favors and any further information that you may give us. (5099)

A raw silk thread for knitting in the gum on tricot machines should be very pliable and yield readily and uniformily to the formation of loops. It must not be open and split as that causes it to break down and make an end out. A solution that gives good results is as follows: For 100 pounds of silk

Neutral olive oil soap	6 lbs.
Cocoanut grease	8 lbs.
Water	75 gals.
Temperature	85 deg. F.
Time	Overnight

The skeins must be opened up full length and tied at three places, just tight enough to prevent pulling out in handing in and out of extractor. Soaking in nets unopened is a very faulty method as the solution does not go through the skein and the inside, where the gums are, if any, does not get any benefit of soaking. As a result, the winding breaks are unnecessarily high.

Rayon and Wool Hosiery

We are forwarding by this mail samples of an artificial silk and wool hosiery line. The yarn used is 2/36 worsted in the top; 250 denier artificial silk over 1/40 worsted in the leg. We realize that the weight of yarn used is probably too heavy for the gauge of the machines, but we find that lighter yarn does not give sufficient covering power. Would you answer the following queries which appertain to the artificial silk and wool portion?

(a) Felting. Some batches of black felt rather badly both in the open vat and in a "home made" dyeing machine. We are installing a Philadelphia rotary dyeing machine of 200 lb. capacity, but have not as yet tested it. Can you inform us what causes felting, and how to prevent it? In using substantive dyestuffs, would there be any matter which would cause shrinking or felting?

(b) Hairiness. This is due to the wool fibre working through the artificial silk face. This is more pronounced in black. Is there any method of dyeing which would obviate this?

(c) Unions. In some colors, especially nigger, we have difficulty in getting a successful union between the artificial silk and the wool. Can you suggest any way around?

(5120)

From the fact that artificial silk and wool are such dissimilar fibres, it is not surprising that felting does occur at times. We suspect that you are now using direct (substantive) dyes for the black. If this is so, there is some probability that the felting results from too great boiling at some stage of the dyeing. There is no substance that can be added to the dyebath that will prevent felting; the proper precaution is to carry on the dyeing at as low a temperature as possible, and to allow the hose to cool down in the bath after the boiling temperature has been reached. These goods should be dyed in a manner similar to the dyeing of ordinary union (half-wool) goods.

We do not quite understand how the wool can work through the artificial silk. What has probably happened is that the artificial silk has lost so much of its strength while wet, that during the working while in the dyebath some of it has worn off, and where this has occurred the wool will naturally "grin through" the artificial silk face. We suggest that dyeing take place in bags, or in rotary dyeing machines where the hose can be placed in compartments.

In dyeing "nigger" on unions, the dyes selected should be such that they exhaust from the dye bath at the same rate. In order to secure this result, preliminary experiments must be made with a number of dyes. We presume that by "successful union" is meant an equal shade on both the artificial silk and the wool. It would be best for you to send samples of the material that you wish to dye a "nigger" shade to some of the dyestuff houses and let them do the experimental work. Heavy brown and mode shades are difficult to produce without considerable experience on artificial silk and wool mixtures.

Mercerized Yarn is Harsh

We enclose herewith reelings of a 2-40s mercerized yarn used for hosiery. It has been skein dyed. We find this yarn so hard and harsh that we cannot knit it. It cuts holes and produces a harsh fabric. We have this in a number of different colors, but they all handle in the same way. Can you ad-

vise us what the trouble is with this yarn, or can you tell us of some method of treating or conditioning it so that it can be knit? (5111)

We regard the peculiar hardness of this yarn as being due to the mercerizing, but we must remark that the mercerizing has been very well done. The only remedy that can be suggested is to treat it with some softening agent and take a chance of its being reduced in stiffness so that it will not cause trouble. This appears to be the only way out of the difficulty.

Selvage Rolling in Fulling

We are having trouble with the list rolling in the fulling mill. I have tried every weave I know of and the straps also. I have two styles, one 38 picks and 36 threads to the inch; the other 36 picks and 32 threads to the inch. Both are all-wool. The list is composed of our regular yarn twisted double and is all-wool. One style runs 2 hours in the mill; the other comes up all right in 40 to 45 minutes. Both roll, but not every piece, and some pieces are worse than others. If there is anything you can advise me to do would be thankful for same. This has troubled us a long time so I put on the straps and that seems to improve conditions, but once in a while we have the same old trouble. The mill will not get a tacking machine, so that is out of the question. (5117)

We would suggest that you try a plain or basket weave in selvage, or just as few ends in the selvage as you can possibly get by with. If you have not tried a twill weave, try one and eliminate double ends, using yarn single, and put in extra ends to bring up to the weight. This is all that can be done from the manufacturing standpoint in reference to overcoming the trouble. In the finishing the tacking machine would be the only remedy.

Mercerizing Before or After Kier-Boiling

What is the most efficient plan of mercerizing; that is, in the gray after desizing or after the kier-boiling operation? (5093)

Best results as regards luster and quality of mercerizing are accomplished after the goods have been singed, desized and kier-boiled. The following opinion has been received from a mill man: I believe that for the highest grade of work it is far better to mercerize after desizing and kier-boiling opera-

tions, as you are bound to get better penetration and undoubtedly better luster. A great many plants, however, mercerize in the gray and bleach afterwards. It is my understanding that the highest grade foreign mercerized finishes are produced after the goods have been desized and kier-boiled.

Stitch Cams

Seemingly there is too wide a difference of opinion among practical knitters as to how the best results are obtained on seamless knitting machines, 220 to 240 needle. It is the writer's personal opinion that invariably the best results are obtained by running a stitch cam very narrow at the casting off point, about 1/32 in. for instance. Parties with whom I have discussed this question are inclined to think that they can get as good results with cams 2/32 in. to 3/32 in. wide. I believe the narrower the point the better the results one can get, with less cutting in the gore, especially when foreign lugs go through the machine. (5068)

This question is one of the most interesting and vital that concerns the knitting industry. Untold wealth has been destroyed by improperly ground stitch cams. The writer began to knit seamless hosiery before the day of full automatic machines, when we cranked the machines in the heel and toe and pulled the needles up with an awl and pushed them down with a long finger nail for the heel and toe knitting. About half of the more than thirty years since has been spent on full fashioned hosiery machines. From the combined experience we believe we have learned that the best fabric is always produced with a wide bottomed stitch cam approximately 5/8 in. as in the full fashioned knitters.

However, in seamless machines we have never been able to use this width of cam except in very coarse gauges. The problem is complex and other things must be considered, the most important of which is the angle at which the needles approach the casting off point.

In coarse machines 45 deg. is the most common angle and entirely satisfactory, but in fine machines such as you indicate this angle should be as acute as you can run safely in order that the yarn being fed to the needles shall be in contact with as few needles and sinkers as possible during the time of feeding. It is the drag over the sinkers and under the hooks which causes 99 holes out of every hundred. Most machines cannot

be successfully concaved much over 48 deg. But if the machines are very nicely made with ground cylinder diameters the angle can be safely carried up to 55 deg. if the stitch cams run very close to the cylinders.

We recommend the use of a template in order to maintain as acute an angle as the machines will stand, and as wide a casting off point as practical. 1/32 in. would be best for most machines of this gauge but if the machines will take a sharp concave ahead of the casting off point we think 3/32s or more would be better. You are right about the lugs going through but the sharper the point, or better, the shorter the low dwell the poorer and more uneven the fabric.

Threads Sticking Together in Sized Warp

I am running 22s yarn on slasher, 2588 ends in a set. Our kettle holds 220 gals. We put in 220 lbs. of starch and 136 lbs. of sizing composition. We are having trouble with the selvages sticking together. We string the set every warp. Can you tell me how to stop this trouble? (5116)

It appears to us that your trouble must be either in the creel or in the size box. We think you are running a very heavy size for 22s yarn. A size that is too heavy will cause the ends to stick together to some extent. We would suggest that you try reducing your size a little by putting in less starch and composition, and adding in their place a few pounds of a good softener such as tallow.

Perhaps you are crowding your selvage at the creel before it enters the size by not having each beam in line with the beam ahead of it, and therefore the selvage ends from one beam are pushed closer together by the next beam, which is set in further than the first beam or narrower in width. The yarn running into the size box in this manner will go through as a tape and if more than one end goes in a dent, two, three, four or whatever number of ends are in a dent will be stuck together.

We would suggest that you look over your beams in the creel. Be sure that the sheet of yarn is coming from each beam the same width, and going into the size box without crowding on either selvage. You might also try making an extra beam in the set by putting fewer ends on a beam. The more ends you have on a beam the closer they are and the more liable they are to stick together.

Shadiness in Sulphur Dyed Piece-Goods

Enclosed you will find sample of sulphur dyed cotton piece goods dyed in padding machine. You will notice, if you observe these goods closely, that there is a shadiness which appears lighter and darker. These goods are in perfect condition when they leave the washing machine after dyeing, but although we have tried batching and plaiting after filling we have encountered difficulties all along the line. When batched the goods after filling appear as if the selvage were oxidized. When plaited the goods appear like the enclosed sample. We are using in our mix 1¼ lbs. per English gallon of No. 140 corn dextrine and 6 lbs. per 100 gallons of turkey red oil. Could you please inform us how to overcome these difficulties, or if by using potato starch in our mix instead of the corn dextrine our troubles would be overcome. (5108)

The shaded or stained appearance of this fabric is similar to defective goods that the writer has seen where a concern was drying sulphur dyed goods on copper drying cylinders. We know that some few concerns seem to be able to dry sulphur dyed goods over copper drying cylinders without any trouble, but the physical and chemical properties of copper in relation to the presence of sulphur in any form is naturally injurious. If the inquirer is using tinned iron cylinders, of course this is not the trouble.

It is rather unusual to figure that corn dextrine will affect colors of this type, unless it is strongly on the acid side. Most concerns starching this class of goods seem to use corn dextrine and have no trouble. Such a thick solution of starch would be inclined to show the difference in properties between corn dextrine and potato starch and we would hesitate to recommend the substitution of the latter as it might give a decidedly different handle to the goods.

Are you sure that the goods have been well washed following the after-treatment as they go through the washing machine after dyeing? We should like to know more about the process of dyeing. For instance, it is a well recognized fact that the best method of dyeing these colors after they have been treated with some malt product, well washed and dried, is through a heavy 3-roll padder over a skying or oxidizing arrangement, and into an open compartment machine of from six to nine compartments, consisting of the washing, after-treating and final wash compartments. We should like to know more about

the actual process and the general specifications and details of equipment. If copper cylinders are being used on the drying process after the dyeing, however, this is probably where the trouble occurs.

Sizing Elastic Webbing

What is a good formula for sizing a cotton textile which contains rubber, such as the webbing used in making abdominal supporters and elastic stockings? What can be used as a preservative for the sizing solution which will keep it from souring, if it is kept for a time before being used? (5098)

A webbing manufacturer replies to this question as follows: We know of no better formula for this class of goods than light gelatine size, using a good quality of gelatine. This, when cold, should remain fit for use and keep sweet for quite a considerable period without the addition of any material for preserving. The proportion used depends largely on the absorbent character of the particular goods being processed, and the finished firmness required. It also depends on the temperature of the sizing, together with the general character of the machine used for finishing. Should the application of the sizing liquor be by the method of passing the goods over and between nip rolls which are revolving in the size pan, the goods do not take up so much size as by the process of immersion, and therefore a heavier body of size is required than when the goods are immersed and afterwards subjected to a squeezing process before passing to the drying cans. In any case it is well to keep the size bath hot when applying, otherwise the size will thicken and have a tendency to remain on the surface instead of penetrating the goods, baking on and giving a harsh handle.

Elastic goods such as those generally used in the making of abdominal belts are mostly of a very open weave, having a long stretch. These soft open weaves do not lend themselves to the use of harsh sizes as such sizes will lock the fibres of the yarns together and interfere with the easy stretch required, besides giving the goods a harsh handle. Covered rubber strands are also generally used, the covering being more or less exposed on the surface of the goods. If this covering comes in direct contact with an unsuitable size, the elasticity

of the goods is interfered with more readily than when the uncovered elastic thread is used, which has more freedom of action in the cavity in which it is woven.

If the method of passing the goods over and between immersed nip rolls is employed, three-quarters of a pound of good gelatine and a like quantity of paraffin wax should give about the right consistency. But if they are immersed in the size and then squeezed out between nip rolls, one-half of the quantities given should be sufficient. Exact proportion can best be determined by experience, as the requirements of different fabrics vary, while the method of application and the heat of the liquor and the heat of the cans are important factors in determining the quantities of ingredients necessary. If the goods should be immersed in finishing, it is well to have the first can on the machine covered with a thin cloth so as to absorb any excess of sizes which may have been carried on the goods, so as to avoid harshness of handle.

Streaks and Loose Lines in Silk Hosiery

The enclosed stocking shows streaks and loose lines in the knitting. We will appreciate having the benefit of your experience and would ask you to kindly let us know whether this condition is due to faulty silk, or if it is in the knitting.

(5109)

The lines in the sample hose submitted are the result of faulty knitting and may be caused by uneven tension, either in the winding or knitting. Probably the tension disks on the knitting machine need adjusting. There is also evidence of trying to knit too loosely in an attempt to save silk in the boot of the stocking which shows very plainly the lack of tension control in knitting.

If the stocking submitted were knit with an even application of moisture on the silk yarn it would also be of assistance in eliminating the streaks and loose lines. There are numerous preparations on the market expressly made for this purpose which may be applied as an emulsion in winding or in knitting.

A careful inspection of the silk does not reveal any fault in that material which could be in any way responsible for your trouble. However, there seems to be an error in the division of long and short butt needles, causing an uneven toe. If you examine the looping corners you will readily see what is meant. There appears to be one or two more short butt

needles than are necessary. Have your machinist spot the cylinder walls on the dividing lines between the long and short butt needles with a small prick punch so that this mistake may be avoided. The splicing also overlaps two needles more on one side of the double sole than on the other. A slight adjustment in your splicing cam at this point would help to improve the appearance of the stocking.

Chemical Crinoline

We are enclosing a prepared cloth for embroidering. Will you please study this out and if possible tell us what solution is used. This is used where, after embroidering, the cloth is supposed to be burned out or washed out so as to disappear, leaving the embroidery in the cloth. (5073)

The cloth is what is known as "chemical crinoline." After bleaching by the usual methods of kier boiling, chemicking, souring, washing, etc., the goods are dried upon a cylinder drying machine and starched with a solution containing ninety pounds of thin boiling corn starch and ninety pounds of corn dextrine, boiled up to make 100 gallons of starching liquor. With this starch liquor about five gallons of concentrated sulphuric acid is used to make a very acid starch. The goods are then stretched on a tentering machine and dried at a very low temperature, not more than 140 deg. F. This leaves them in the condition of the sample. They are used as a backing on embroideries to keep the stitching, etc., in place, and to act as a support on the embroidering machine. After embroidering they are put in an oven, which is gas heated, and baked for twenty minutes, when the crinoline becomes decomposed and can be shaken out of the embroidery as dust.

Recording Labor and Repairs on Machines

Will you kindly advise the most satisfactory method for recording labor and repairs on the individual machines in the factory. (5057)

The inquirer does not state whether he refers only to recording the cost in labor and material for repairs, or whether he has in mind operating labor also. In what follows we have both in mind.

In the first place each machine must be numbered, either consecutively throughout the entire mill or in each department.

That is, the machines in the spinning department may be S-1, S-2, S-3, and so on; those in the weave room may be W-1, W-2, W-3, and so on. Or the numbers may run continuously throughout the mill. For the purpose in mind, the former method is preferable.

The keeping of the operating cost, that is, labor only, is a simple matter of detail on the part of the timekeeper. If John Doe works on machines S-1, S-2, and S-3, then his time is so entered each day in the time book. At the end of the pay roll period the total amount gives the labor to be charged to those machines for that period.

For the proper keeping of repair costs in both labor and material, several forms might be adopted. One form is an order made out by the overseer of the textile department on the repair department for repair work to be done. On a line marked "Machine No." is entered the number of the machine which is to be repaired.

Another form is filled out either by the textile overseer to obtain any supplies for his work; or if the man who makes the repairs needs any material in connection with the work he uses the same form. Here again, the "Machine No." should be entered.

A third form is a weekly time sheet for the man in the repair shop. In the first column on the left is entered the number of the machine on which the work is being done as taken from the overseer's order. In other columns are entered the hours worked or whatever days. The entire time of the man for the week is thus analyzed and tabulated. These sheets are made out by the men, examined and signed by the foreman, and then sent to the timekeeper on each Monday morning.

A fourth record is a monthly form used by men whose work does not vary in distribution from day to day to any extent. It is used chiefly for operating engineers, oilers, etc., rather than for repair men. It could be easily adapted for keeping the cost and distribution of operating labor.

Another form is for summarizing materials that have been used on jobs, such as lumber, pipe, iron and steel, etc., and miscellaneous supplies as well .

It is obvious that the use of these forms or others will necessitate some clerical labor, and also some work on the part of the men doing the repairs. But when once installed the system will give correct and immediate results as to both operating and maintenance costs.

Dyeing Duck With Mineral Colors

We are sending representative piece of buff on eight ounce duck. This is claimed to be dyed with iron. Can you give us a practical formula for arriving at this shade using mineral colors? (5090)

This sample has been dyed with mineral dyes. The shade can be produced approximately by padding the goods on a two-nip padder in a solution (cold) of

45 gal. Acetate of Chrome 32 Tw.
27 gal. Acetate of Iron 16 Tw.
12 gal. Water.

Age about six minutes, running twice through ager if necessary, then run in open width through boiling solution of soap (½ ounce) and soda ash (¼ ounce per gal.) and wash. Increasing the proportion of iron will make the shade redder, whereas more chrome will make the shade greener.

Weaving Tinsel

We would appreciate it very much if you would give us some information pertaining to the manufacture of tinsel fabric. We are enclosing a sample of the tinsel we refer to. This material is used as warp. We have made experiments with cotton harnesses, which proved entirely too rough, that is, the eyes of the heddles are not smooth enough for the tinsel thread to pass through. Heddle harnesses also proved unsatisfactory. The density of these warps is from 40 to 80 ends to the inch. (5055)

Under a glass the tinsel shows up as a flat tape-like thread that is loosely twisted. This thread is of a size that would compare with a 2/20s cotton thread; that is, the distance across the flat side of the thread is about equal to the diameter of a cotton thread of that size. Unless the tinsel were drawn on a large number of harnesses the space taken up by the threads would make the condition in the harnesses very crowded, particularly if the sley were around 72 to 80. The weave would have some influence on a warp made up from the tinsel, and the question arises whether it is the harness or some other factor that is causing the breakage or splitting of the tinsel thread.

If the warp is run over a whip-roll the bending of the thread over the roll would have a tendency to split it before it reached the harnesses. This is the reason why some yarns have to be

fed straight from the warp into the harnesses, instead of passing over a whip-roll. If it is really the harnesses that are splitting or breaking the thread it cannot be that the cotton harnesses are doing this because cotton harnesses can be bought that will weave 100s cotton warp very successfully. Such harnesses or healds are made with two to three-ply cotton twine, using Sea Island.

Our opinion is that the harnesses are not too rough but that the tinsel eats into the varnish of the heald, cutting a groove and that the irregular tinsel thread gets caught in the groove and is broken. We doubt if the varnish on the cotton heald would last many days when using such a thread as the tinsel submitted, and after the varnish is gone the heald will not stand up very long.

The round wire galvanized heddle would act about the same, for the tinsel would soon eat into the galvanized part of the eye and cause a slot to be formed, just as the slot would be formed on the cotton heald. Owing to the irregularity of the tinsel thread the slot would soon stop the progress of the tinsel and the thread would break.

We have a lot of faith in the flat steel heddles and are sure that if they were strung very carefully and loosely and tried out under proper conditions there would be little trouble.

In the weaving of cloths with threads that are liable to split or break from pressure or tension, it is a mistake to weave with a low number of harnesses. At least 8 harnesses should be used for an 80 sley cloth. This would mean ten heddles per inch and would give the thread lots of working space. It is possible to use 8 harnesses when weaving plain on the ordinary cam loom. All that is necessary is to string the harnesses up in pairs. It would be still better to use what is termed a double plain cam. In this way the two pairs of cams, cast in one piece, could be timed differently and when the sheets of tinsel thread were passing each other in the reed they would be slightly apart. This would obtain in the harnesses when the sheds are being formed.

Scouring Heavy Ribbed Underwear

We are manufacturing men's heavy ribbed underwear from a batch composed of 80% quarter blood carbonizer wool, 10% colonial scoured Australian, and 10% pulled rag from the same batch. The stock is oiled before carding with an olive oil

emulsion, four quarts per 100 lbs., and we use the following formula for scouring the ribbed cloth in the roll, 65 lbs. cloth per set, in a three hammer tom-tom machine.

1st wash—3½ lbs. palmoil chip soap dissolved in warm water, plus 13 lbs. 58% light soda ash; run 20 minutes and rinse well.

2nd wash—2½ lbs. palmoil soap, 8 lbs soda; rinse.

3rd wash—2½ lbs. soap, no soda, rinse well for about 15 to 20 minutes; water in tank kept at temperature of 120 deg. Later, extract and bleach with sulphur.

This scouring formula costs us about 28c per dozen for soap and soda. What I would like to know is, do you consider we are using too much of either soap or soda? How is one to know the proper ratio in which to use these in the first and second liquors? If the olive oil emulsion and other animal oil is all saponified in the first scouring liquor, are we then adding too much soda in the second liquor? Is there any means by which one may know that too much alkali is being used? What effect would a surplus of soda have in the action of the soap? If goods feel, smell and look absolutely clean when dried is there much likelihood of stains developing later as the goods stand around in packages? (5083)

Your amount of soap is about right for the weight of the cloth per set, but cut down on the amount of alkali used as follows:

1st wash—3½ lbs, palmoil chip soap dissolved in hot water, plus 3½ lbs. 58% light soda ash; run 20 minutes and rinse well.

2nd wash—2½ lbs, palmoil soap, 2½ lbs. soda; rinse.

3rd wash—1½ lbs. soap, no soda; rinse well first in warm water until all soap is out of cloth, then rinse with cold water until cloth is cold. Extract and bleach with sulphur as per your directions.

The proper ratio of soap and alkali to use in the first and second washes is largely a matter of experiment, knowing only your grade of cloth and the results you wish to obtain as guides. A surplus of soda might have the effect, if it were more than a certain strength, to throw the soap out of solution, thus making it less effective.

If you are certain that your goods have all soap and alkali out of them at the end of your last warm water rinse, you should not fear that later stains will develop as the goods stand around. If stains do develop you must look to your bleaching or other operations through which the goods pass.

Black Specks in Wadding

Enclosed you will find a piece of wadding which is perefect except for black little seeds that show too prominently. We would appreciate very much any information you can give us in regard to what chemical is best qualified to make the black points fade away, either totally or partially. (5091)

The inquirer cannot get rid of these imperfections and make a perfectly white wadding except by bleaching his raw stock. This process consists of boiling the stock in a pressure kier with caustic soda liquor figuring about 3% on the weight of goods. After boiling from 6 to 8 hours under 15 pounds pressure in the kier the goods are washed down first with warm water and then with cold water in the kier, and then automatically tipped from this kier into a vat containing chloride of lime liquor. This chloride of lime should stand at about ¾ to 1 deg. Tw. The stock will require one to two hours saturation with this liquor to bleach, after which it should be thoroughly washed through a raw stock washer and then dried through a raw stock dryer.

Tubing Tangles in Dyeing

We are writing you to find out if you can give us a solution to the difficulty which we have recently encountered in our mill. We enclose a sample of the tubing which we have to dye in lengths of approximately 100 yards, weighing about 9 lbs. Our machines are ordinary piece dyeing ones (six string) with winch, and roller in front to help lift the material out of the liquor. Our difficulty is that they tangle very badly and after a few turns they will not run, especially so when the bath is boiling. We are using direct cotton colors for light shades such as sky blue, etc. Any information that you can give us will be greatly appreciated. (5079)

It is somewhat difficult to venture an opinion as to the direct cause of the strings of tubing twisting and tangling during the dyeing operation. One condition that certainly contributes to the twisting of the tubing as it goes over the winch is the unequal contraction of the knitted fabric. The other condition, which appears to be aggravated during the actual boiling, is the tumbling of all that mass of tubing lying in the bottom of the kettle, and which is undoubtedly thrown about by the influx of direct steam. The trouble, however, is purely mechanical. No doubt the dragging action of the roller causes a mass of tubing

to tumble over on itself while releasing the bottom part, and this causes both twisting and tangling.

Backwashing Tops

I would like to have some information on backwashing fine quality dyed tops, running the tops from a revolving creel to the backwasher. The tops are dyed in a round kettle and after they are taken out are a little out of shape. They are then put in an extractor and when they get on the creel won't start off very good; will fall off the rollers and we have quite a bit of trouble with ends licking or lapping on the balls in the creels. We can use a spindle in the center of the tops but that is quite a job and does not help much. What makes the ends stick and lap around the bottom squeeze rolls of the backwasher and sometimes around the top (wool lapping) squeeze rolls? (5016)

The balls or tops are too heavy to run in the creel. The best way to run them is right off the floor from the center of the top. Your bottom squeeze roll may be rough or your top roller may be lapped very poorly and not squeeze properly. That will cause it to lick up. Put a dipper of warm soap on your top roller once in a while.

Labor Costs for Different Yarn Sizes

Kindly let us know through your Questions and Answers page if, in comparing labor costs in a spinning plant, we are correct in dividing the total cost with the average number of yarn to put the cost on a basis of 10s. For example, say our cost is .0767 for an average number of 13.15. Dividing .0767 by 13.15 gives a cost of .0583 for 10s, assuming that the method of procedure is correct. (4939)

The practice of dividing the average labor cost per pound by the average number to put the cost on a basis of 10s yarn may be reasonably accuratee in cases where the average number is as close to 10s as in the illustration. This method of costs would be very inaccurate and undesirable if the costs per pound of 10s, 20s, 30s or 40s were desired. A more accurate and simple method of figuring labor costs per pound is that of determining the labor cost per spindle week (which is done by dividing the total labor cost per week by the spindles operated), and dividing this cost by the pounds produced per spindle week of the counts of yarn desired.

It is apparent that the cost per pound of yarn depends almost wholly upon the rate of production. In dividing the average cost per pound by the average number and obtaining a cost per pound of 10s, it is assumed that the cost per pound of 20s yarn would be twice as great as the cost per pound of 10s, since 20s weighs just one-half as much as 10s. If the production per spindle week of 20s was just half as great as the production per spindle week of 10s, then the proposed method of using the cost per pound of the average number would be comparatively accurate. Since this is not the case and it is readily proved that the production per spindle week of 20s is much less than half as great as the production per spindle week of 10s, and the production per spindle week of 40s is considerably less than half as great as the production per spindle week of 20s, it is easily seen that the method outlined could not be applied with any degree of accuracy to a spinning plant producing a wide range of yarns.

On the other hand, if we obtain a labor charge per spindle per week and divide this charge by the actual weekly production per spindle week on the count of yarn for which the cost per pound is desired, we obtain a sufficiently accurate result. Furthermore, we are employing a method which is not only extremely simple, but which can be applied to almost any spinning plant, regardless of the range of yarns, with no misgivings as to its accuracy.

Finishing Khaki

I am enclosing herewith a small sample of khaki drill cloth and would greatly appreciate it if you could obtain for me a formula to obtain the same finish; also the best methods to use to give a prominent twill. (5069)

There is a very little, if any, actual starch filling in this sample. As a matter of fact, the trade in this class of goods prefers that no starch be used. After dyeing they are simply treated with a little softening oil and then dried over a cylinder drying machine.

Most concerns run these goods over a 40 ft. straightaway tenter after drying, with a steam jet playing on the back of the first section of the tenter. This as a rule tends to raise the twill. If this does not give the full results required, we would suggest the use of a so-called raining or twilling machine which consists of the necessary framework carrying a 30 in.

diameter copper cylinder heated with steam, held in a fixed position so that it does not revolve. The goods are taken to this machine on rolls and run over this cylinder with a reasonable amount of tension, and wound on the batchers.

Yarn Production Calculation

Will you please figure this out for me. We have a room with 20,000 spindles on 40s yarn.

10,000 spindles running 17½ hrs.
5,000 spindles running 30 hrs.
5,000 spindles running 48 hrs.

What is the average pounds per spindle for 48 hrs.?
(5072)

Although the question is rather vague, the writer has assumed that the inquirer is in search of a method of determining the equivalent number of spindle weeks (of 48 hours) run. A suitable method is outlined below:

10,000 spindles running 17½ hrs. = 175,000 spindle hours (10,000 x 17½).
5,000 spindles running 30 hrs. = 150,000 spindle hours (5,000 x 30).
5,000 spindles running 48 hrs. = 240,000 spindle hours (5,000 x 48).

This gives us a total of 565,000 spindle hours (175,000+150,000+240,000). By dividing 565,000 spindle hours by 48 hours, we arrive at the equivalent number of spindle weeks run, which is 11,771.

The production per spindle week is determined by dividing the total production in pounds by the equivalent number of spindle weeks run. For example, if we assume a weekly production of 8,000 pounds, the average pounds per spindle week would be .68 (8,000 lbs. ÷ 11,771 spindle weeks).

Putting on New Rub Apron

I would appreciate very much any information you can give me regarding the following: Why is it that so many carders cannot put on a new rub apron in pairing up with one that is half worn, without having the ends running as if that section of the spool drum was running slack? They claim it is impossible to run it without putting another new one in with the first one. That is, they sacrifice the half worn out apron, and put two new ones in. What is the best way to center up the rub

aprons so as to have the right clearance on both sides from end of roll to buttons? (5197)

It is a rule with some carders to keep the new rub aprons on the front as much as possible. The reason for this is that the old well-broken-in apron is easier in its action on the tender web as it comes from the rings. It is sometimes difficult to get a new apron to go well with an old one, as the old one is often worn more on one end than on the other, which will cause an unevenness in the rub. When this is the case, the only remedy is another new apron.

The proper way to center up the rub aprons in order to have the right clearance on both ends is to put the apron in place on the rolls while they are loose. Then draw them out to the same distance on each end. Measure with a rule to get each end the same tension. Watch the buttons while drawing out the connecting nuts, to see that the apron does not move. If the tension is the same on each end the apron will remain in place.

Rayon Stripe Woven Too Tight

We are enclosing herewith sample of fancy cotton shirting with an artificial silk stripe. This was a sample piece and was given a caustic and ash boil, bleached with liquid chlorine and soured through sulphuric acid, starched on a regular two-bowl starch mangle and dried on a 60 ft. hot air tenter. You will note the sample has a crinkly or seersucker effect, and our object in writing you is to request that you advise us just what process we should employ to overcome this crinkly effect. (5207)

It is very evident that these goods are made with the artificial silk stripes woven under too much tension. The finisher would have no trouble if the stripes were woven at the same tension as the ground warp.

A finisher replies to this question as follows: The cause of the crinkly effect in the finished piece of goods is due to the fact that the artificial silk threads are woven too tightly. We have experienced the same difficulty working on goods of similar construction. Changes in the processes through which we put the cloth, such as scouring in rope form with soap and soda ash rather than kier boiling, and, after chemicking, treating with bi-sulphite instead of acid, had no beneficial effect on the final appearance of the cloth.

After the above had been printed, the following comment was received from an English reader:

Referring to your answer to question No. 5207, in the Oct. 11 issue, which discusses the cause of a crinkly effect in finishing a cotton shirting with artificial silk stripe, I consider that this requires some additional explanation. In weaving such goods as are described, it is essential that the artificial silk should be warped on to a separate beam from the cotton, and this beam must be weighted as lightly as possible to admit of good weaving.

It must be realized that artificial silk (viscose) which has been sized in the warp is stretched as much as 5 or 6% in the sizing process and that contraction takes place on boiling-out and drying. This is the chief cause of the tight stripes. Hence the necessity of weaving the artificial silk considerably slacker than the cotton.

As a matter of fact, viscose in stripes, after warp sizing, requires to be warped about 8% longer than the woven or gray length, the extra 3% being allowed for take-up in weaving.

W. S. GILLES,
Courtaulds, Ltd.,
Braintree, England.

(The above correspondent agrees with the practice recommended by Percy Bean, the well known British authority on sizing and finishing, in the article "Bleaching Artificial Silk Stripes," which was printed in the Oct. 25 issue of TEXTILE WORLD.—Technical Editor.)

Length of Hosiery

Will you kindly advise us the general opinion on the possibilities of manufacturing seven-eighths children's hose with fancy tops to an exact measurement in length? That is to say, if a size 8 should measure 16 inches from the heel to the top of the cuff after it has been turned, is it possible to make every pair come exactly 16 inches, or would a run of say 100 dozen of this size vary when paired from 15½ inches to say 16½ inches? We are having difficulty in this class of goods to within half an inch either way of a given length, and would like to find out if any manufacturer can get an exact length, or what the general custom is on this question. We would appreciate a prompt reply as we wish to accept an order but must have this point settled before we bind ourselves. (5191)

It is an impossibility to produce hosiery to an exact length since the yarn from which it is made cannot be spun without a variation of 2 to 5%. If the inquirer can produce goods with a variation of ½ inch either way he is doing very well and the writer can state from thirty years of experience that his products will compare favorably (for length) with those of other manufacturers.

Selvage for Three Harness Twill

In making worsted cloth as per enclosed sample, we have had considerable trouble with the selvage. Being a 2 up and 1 down twill, and for special purposes, we desire to obtain a fine selvage. Our trouble is that the selvage rolled in finishing. If you can suggest a fine selvage that will not roll we will be greatly indebted for same. (5204)

With the selvage yarns approximately the same size as the body warp yarn, the most attractive selvages will be produced by adopting the common four-leaf twill weaving plan, 2 up and 2 down. This, of course, will necessitate using four extra harnesses. Another method is to draw the threads straight on two extra harnesses, two threads in one heddle, and weave with regular plain weave, 1 pick in each shed. Set the selvage yarn a little farther apart in the reed than the body warp yarn. It is also expedient to sew the selvages of each piece together with the face of the cloth inward before starting wet finishing operations.

Slide Rule and Mill Calculations

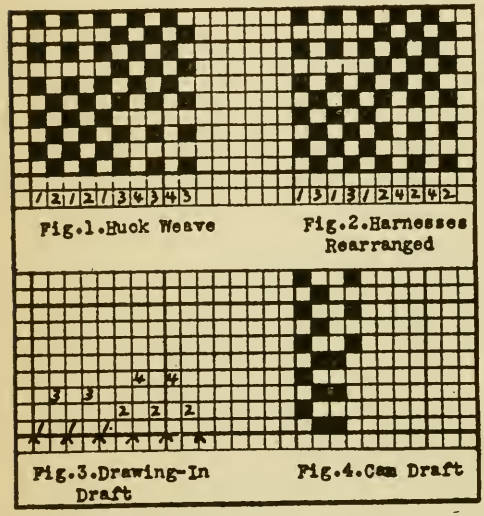
Do you think a slide rule is accurate enough for calculating the wages and production in the yarn preparatory departments of a cotton mill. (5065)

A slide rule of the right type and size is accurate enough for calculating wages and productions in cotton manufacturing. For pay roll work, which will usually involve four figures, a twenty-inch rule is about the smallest that it is consistent to use. There is also a type of revolving calculator built on the basis of the slide rule which is suitable only for desk use, that will do very well for this work. Some of these calculators will read six figures. There are several mills which make extensive use of slide rules.

Huck Weave and Cam Loom

I would like to ask a question about a huckaback weave. Can it be woven on cams? I have woven it on a dobby with 4 and 8 harnesses. I am experimenting on cams and if you could tell me something that would help I would be very thankful. (5070)

The huck towel weave repeats on ten picks and ten ends, but it does not follow that ten harnesses will be required to produce this cloth. A study of Fig. 1 will show that the weave can be produced by the use of only four harnesses, but 10 picks will be required. There is no reason why this cloth cannot be woven on an ordinary plain loom equipped with an auxiliary cam shaft and most all modern looms are thus equipped.



Huck Weave on Cam Loom

At the bottom of the weave at Fig. 1 is shown the arrangement of the threads for the four harnesses. Fig. 2 shows the same threads arranged so that the two harnesses weaving plain can be placed in front and the two harnesses that are weaving the float can be placed in the rear.

With the threads arranged in the harnesses as described there is no reason why the huck towel cannot be produced on the cam loom, but only as a straight weave all through; that is, no fancy borders can be woven, although color can be woven in with the same weave as the ground if a plain drop box loom is used.

Fig. 3 shows the drawing-in draft to be used for the four harness draw and Fig. 4 shows the order in which the cams should weave.

To weave this cloth on a cam loom equipped with an auxiliary cam shaft, a pair of ordinary plain cams should be set-

screwed on the bottom shaft of the loom, or what is termed the pick cam shaft.

The two harnesses that are to be operated with these cams can be rigged up with an ordinary top roll, just as though no other harnesses were employed to weave the cloth. Another pair of ordinary plain cams should be used on the auxiliary cam shaft and rigged up with a separate top roll.

The cams on the pick cam shaft will weave plain and will operate the two front harnesses; also the selvages, which will be drawn in these two harnesses. The cams on the auxiliary shaft will operate number three and four harnesses but the movement of these cams, located on the auxiliary shaft, will be such that ten picks of the shuttle across the lay will equal one complete revolution of the pair of cams located on the auxiliary shaft. This slower movement is produced by changing the gearing on the combination of gears usually found on the auxiliary shaft sets.

Waste in Manufacturing Narrow Fabrics

We are manufacturer of narrow fabric braids in silk, artificial silk and cotton, and of course, like all other manufacturers, have a certain amount of waste. We keep an accurate record of our percentages of waste in the various departments, which would be in the winding of the yarns and also in the braiding. These records are made monthly and turned in to the production department. In going over them we find that some months the percentage of waste is a great deal higher than other months. We had occasion last month to have a very big increase in our loom department in the winding, warping and weaving. We would like to know if you have any information in your possession which you would consider a fair percentage of waste in the manufacture of narrow braids.

(4976)

The question of waste in any branch of textile manufacturing is always a difficult problem, involving much uncertainty. No standard can be established which will be suitable for general application. A variety of conditions are likely to be present from time to time which may upset all previous calculations. The variable quality in the materials used is one element of uncertainty, as is also the character of the labor employed in manipulating it.

Material of the very best quality may have been so handled in the process of bleaching or dyeing as to make it almost im-

possible to spool it without excessive waste. Artificial silk is subject to such conditions, perhaps more than any other of the materials employed. Not having much elasticity there is considerable liability of the breaking of threads when undue stretching takes place in processing. When these yarns come along all right, whole frames may be kept running with little or no waste; while at other times it may only be possible to keep a few skeins running. The amount of waste will of course vary accordingly. So it is all along the line. We might go on to illustrate in a variety of ways how the element of waste varies very much under different conditions.

The foregoing suggests that overseers and others in charge should be watchful at all times to bring waste down to a minimum. Once let down the bars of vigilance in this respect and the manufacturer must pay the penalty. Carelessness and indifference will creep in and all kinds of advantages will be taken of a weak overseer so that the waste item will speedily become a formidable expense.

The most effective method at the machines is to demand that every particle of waste made be kept in sight at all times. This affords an opportunity to check excesses in the early stages, and it is much better to prevent waste than it is to correct careless habits.

All things considered the most satisfactory method of establishing a basis for calculation of waste is to spread the actual losses from this cause over long periods and take a liberal average to cover unexpected fluctuations. Some narrow fabric mills allow one-quarter of one per cent., while there are others who do not feel safe with less than two per cent. figured for waste covering all processes. The only way is to let each mill on specialty lines work out its own problem.

Underwear Costs

I would be very glad to receive any information you could give me on the following questions regarding knit union suits for men, size 40, weight about 12 lbs. per doz. garments:

What is the average cost per doz. for seaming?

What is the average cost per doz. for cutting?

What is the average cost per doz. for making cuffs?

What is the average cost per doz. for sewing on the cuffs?

About how much waste is made per doz. in oz. from seaming?

About how much waste is made per doz. in oz. from cutting garments? (5071)

The following reply to this question has been secured from an underwear manufacturer: The data refers to men's closed crotch style, size 40, knitted union suits with long legs and sleeves, and is applicable to light, medium or heavyweight fabrics.

The piece work cost of seaming on (Willcox & Gibbs flat lock machine) entire garment including collar, shoulders, sleeves and legs, and excepting only across top of back flap and seaming on cuffs, is 38½c. per doz. garments.

The piece work cost of cutting, including laying up and cutting bodies, sleeves, collars, shoulders and flaps complete is 12c. per doz. garments. The piece work cost of cutting and tying in bundles twenty-four sleeve and twenty-four leg cuffs (48 to each set) totals 2½c. per set, sufficient for one doz. garments.

The piece work cost of seaming on the forty-eight cuffs to sleeves and legs complete, if this operation is being done on a Union Special sewing machine, is 6½c. per doz. garments.

Records over many years of men's union suit production show that the average waste (both necessary and unnecessary) in a well regulated cutting department should be 14%. Any cutting room giving a lesser percentage is operated extremely well.

I do not know how much waste in ounces should be seamed off the garments, and I do not believe it is possible to set any standard rule in this regard. One operator may average only ⅜ to ½ in., while another equally efficient operator will seam off as much as ⅝ in. I think that providing an operator follows carefully the lines of her pattern that ½ to ⅝ in. seamed off should be satisfactory; more satisfactory than an operator who tries hard to seam off ¼ to ⅜ in., and very often does not get both edges of the fabric under the machine, causing bad work.

Matching Finish on Cotton Cloth

I am enclosing herewith a small cutting of finished dobby stripe and would greatly appreciate information on how to proceed to match the finish; also the machinery required.

(5097)

Goods like the sample should, after dyeing, be dried on a cylinder drying machine or over a hot air automatic clamp tenter with housing, depending upon the width allowance on the woven and finished cloth. It is very evident that the sam-

ple has been dyed on a padder with the necessary amount of softener probably added to the dye liquor to give the goods the soft feel.

After either drying or tentering the goods should be conditioned, after which they should be passed over a 5-roll calender, preferably one with 4 cotton rolls and 1 cold iron driving roll. If such a calender is not available it is possible to use a regular 5-roll calender with the metal rolls not heated and covered with a cotton cloth wrapping. This will give the thready or clothy appearance shown on the goods. The cloth is then ready for putting up.

Yarn Condition and Testing

I would like to have your advice on one or two matters which are not very clear to me at present.

1. Can you explain the American grain system of counting yarn?

2. Can you advise me as to the percentage of humidity required to get the best spinning results on fine worsted yarns?

3. What is the standard length taken or used when testing yarns for strength and stretch?

4. What is the official standard allowance (if there is such) of moisture in yarns? (5004)

1. There are two systems in common use: The New Hampshire system, which uses 50 yards as a standard and the grain weight of 50 yards is the number of the yarn. The other system is the "Cohoes" which uses a standard length of 6¼ yards. The weight in grains of 6¼ yards is the number of the yarn. Both are used for woolen yarns (not worsted).

2. Two conditions are essential for success in spinning fine yarns on the French system, namely, percentage of moisture in the roving and the relative humidity of the atmosphere. It is understood that ideal conditions exist when the roving is yielding up moisture to the atmosphere, rather than absorbing it. Consequently there will be ideal conditions for fine yarns when we maintain a temperature of 75 to 80° F., relative humidity of 75%, and a roving with 18% regain. The high temperature is necessary to maintain a proper temperature of the drafting mechanism, keep the fibres supple or pliable and also allow more moisture to be held in suspension in the atmosphere.

The above remarks apply to mule spun yarns produced from a dry top. In spinning fine yarns upon ring frames it is the

writer's opinion that, due to the continuous method of winding, a lower relative humidity, smaller regain in roving, and possibly a semi-dry top containing 1% to 1½% of oil will give a better spin.

Bradford or English spun yarns require a lower relative humidity than the French system. For fine yarns produced from oil combed tops, 75 to 80° F., with relative humidity of 50 to 55% will give ideal conditions, providing the roving has been aged and conditioned.

3. There is no official standard. There are two methods of testing in general use. Skein test: Usually one-seventh of a hank (80 yds. for worsted) is wound upon a yard reel. The loose ends are tied, giving eighty loops. The skein is tested upon any suitable testing machine. Single strand test: The length selected should be longer than the maximum length of fibres in yarn so that no fibre can be gripped by both jaws during any test. For fine wools, 56s to 80s, a distance between jaws of twelve inches would be sufficient. For coarse wools below 56s, eighteen inches would suffice.

4. There is no official standard. Where one mill purchases yarn with a stipulated condition there are large numbers that purchase the yarn "as is." Imported yarns are sometimes purchased on the common British and European basis of 18.25% regain.

Defective Milanese Cloth

We are sending you a sample of our black milanese cloth and would call your attention to the reverse side of this fabric. You will notice some fine schaff marks which take on a whitish appearance. We have had considerable trouble with this for some time and would appreciate it if you would advise us what you think may be the possible cause of this trouble. (5046)

The sample of milanese cloth sent us is very defective in several particulars. Not only is the weaving of the cloth very poor, but the dyeing and finishing is far from good. Either the dye tub or the roller over which the cloth has passed is splintered, causing a roughness on the reverse side of the fabric, which is on the outside of piece after edges have been put together previous to the dyeing. In addition to this the wringer has not been clean, as there is some white starchy matter pressed onto the cloth as though it had been sent through rollers smeared with starch or like substance.

The machine on which the cloth has been made has the picker bar out of order. There are a number of picker points missing the threads intermittently, causing lines of pinholes in the material.

The weaver has also some slack bobbins or sections of warp in the machine, causing the pickers to miss the threads more frequently while the slack sections are passing, also causing slack diagonal stripes in the fabric.

The heels of the pickers we believe are also chafing the reverse side of the cloth during the weaving, caused by the pickers approaching too closely to the sinker bar when pushing the threads over the needles, thereby trapping the cloth between picker bar and sinker bar. This will cause fluffy places in the material. It seems there are also a number of vegetable fibres woven into the cloth as they have not taken the black dye. This is seen by putting the cloth under a magnifying glass. If there has been cotton or artificial silk nearby during the warping or weaving that fact would account for it.

See that the pickers enter behind the still points identically; that is, the picker and still points should look as one when viewed from the front of the bar. The pickers also should enter the center of needle spaces and be identical with the sinkers at all times.

The stop collars and screws at each end of the picker bar rocking shaft must also be kept tightly in position on the ends of the shaft, otherwise the pickers will be sure to miss the threads. The same also applies to the still bar rocking shaft, as any lateral play in that shaft will cause both doubling and misspicking.

Padder Box for Mercerizing Frames

I would like to know what in your estimation is the best type of padder box for mercerizing frames as regards size of tank, number and method of dips and arrangement of padder or padders in the padder box. (5092)

The best type of padder box is a question of personal opinion. The writer has heard many opinions along this line from practical men who are doing good work. The most generally used type, however, and one which is in use at a New England plant which has the reputation of doing the very best work along certain lines, consists of a cast iron box. This box is the necessary width, connected between the side frames of a

40 in., 50 in., or 60 in. wide paddler. It is about 18 in. deep and 4 ft. long. It contains three immersion rolls before the first nip and three immersion rolls after the first nip, the padder having three rolls, two of which are iron 15 in. diameter, and the third rubber covered, 15 in. diameter. In fact, this concern uses two padders running in unison, followed by an 80 ft. tenter and a 6-compartment washer.

Silk Fabric Has "Soapy" Feel

Kindly send me a remedy for the following defect in silk. After the silk is skein dyed and woven into the fabric, it is sent to the finishing department and the cloth is very soapy to the touch. The result is that after finishing the cloth is dead to the touch, lacking scroop. Please recommend some article that cuts this soapy touch and gives the silk lots of scroop. (5066)

Without more definite information and a piece of the material, it is rather difficult to suggest a remedy. If the color will stand it, it might be a good plan to give the silk piece a hot water treatment to wash out the soap and then give a bath containing about 5% acetic acid (28%) at 90 deg. F. for ten minutes. About 1% tartaric acid crystals will give a more permanent scroop than acetic acid, but is more expensive. The inquiry does not state whether the soapy feeling comes from the dye bath or from the finishing bath. If the silk skein has been properly degummed before it is dyed it should not have other than a nice scroopy feel when it comes from the dye bath. If the degumming and dyeing have both been properly done and the silk feels soft or soapy after it comes from the finishing department, it will be necessary to change the finishing formula.

Uses of Soft Silk Waste

We would appreciate it very much if you would inform us what manufacturers use the soft silk waste, and what is made from this product. (5035)

Soft silk is the term generally used to describe silk from which the gum has been entirely discharged by boiling-off, or other treatments. Into this category therefore will fall a number of different sorts of wastes from various silks, such as boiled-off organzine, not dyed, and not weighted, which would

be used for the warps of warp print goods, and also used for "effect" yarn stripings by the manuafacturers of fancy worsteds, and women's dress goods, and for sewing or embroidery silks of various kinds, etc. Organzine and tram, pure dye, but not weighted, are similarly used, and also to a limited but substantial amount in other weaving trades, and in various other directions.

Then organzine and tram, weighted or adulterated to a greater or less extent is used in nearly all branches of the industry, but particularly in the weaving trade where they are employed on a great scale. These, in turn, may be either whites, colors or blacks, the adulterants used in the blacks being generally of a different character from those used in the colors.

Such wastes as boiled-off and unweighted tram, uncolored, could probably be sold to the manufacturers of spun silk, for the twist in the yarn being very little, the material could be satisfactorily worked up in this industry.

The colored and weighted tram and organzine, however, constitute the vast bulk of the soft-silk waste material. By far the greatest proportion of the weaving waste generally comes from the looms in tightly rolled-up balls made by the weaver as the waste gradually accumulates while weaving out his warps, and this will apply both to blacks and to colors. This black silk waste has been largely bought by woolen manufacturers in this country, or by waste dealers who prepare and sell wastes to the woolen manufacturers. By "woolen manufacturers" is meant those who make carded woolen goods, and not those who manufacturer worsteds. These wastes, after being torn apart by suitable machinery, and well opened and regularized, are used for mixing with suitable woolen materials in which, by the length and strength of the fibres they assist in the spinning of yarns in which more or less short stock is used, and by their luster they give a brighter appearance to the yarn. It is possible also that some standard colors, such as navy blue, may also be used.

Regarding the general run of colors, however, the question is quite different. These are so varied in color and in amount and the dyes on them are so different, that a lot of expensive preparation would be needed to reclaim them, and even then their use here would be relatively small. The great bulk of this stock is, I believe, shipped to Europe, and is made use of

there. I understand that over there, after the wastes are opened, the colors are discharged from the material as far as possible, and then it is thoroughly blended together, resulting in an average color, generally of a dirty grayish-violet shade. This is spun up into spun silk yarn of rather coarse count, and low quality, and is then dyed, or the stock may be dyed before carding.

Again, such stock might be treated by roughly grading the colors into reds, blues, greens, yellows, etc., and then after these wastes were opened up and made into spun silk yarns, these yarns, having then had their colors averaged down to one general level, could be used in that state, or possibly might be dyed again in the yarn form into a deeper color of the same shade. The filling yarns of very fugitive colors, by the way, that were employed in making the Bellaggio rugs that were largely seen on the market twenty odd years ago, and which are reappearing, seem to have been produced in this manner. These Bellaggio rugs which had cotton warps, largely concealed by the thick, soft, silk filling, were characterized by broad bands of loud and sharply contrasting colors running crossways. JAMES CHITTICK.

Bleaching Spun Silk and Merino Cloth

We would appreciate any information you can give us on bleaching and processing of silks and silk and merinos so as to secure softness and luster in the finished fabric. We enclose samples bleached with peroxide of hydrogen. No. 1 is spun silk, Cooper knit, unbleached stock. No. 2 is a bleached sample; note harshness and lack of luster. No. 3 is a bleached sample that is lustrous and soft. All three samples are made of the same quality silk and processed the same. Why do we obtain some excellent results, soft and lustrous like No. 3, and at other times results like No. 2, which are far from satisfactory? Our bleaching process is as follows:

To 400 lbs. of fabric.
500 gal. water
5 gal. albone
15 gal. liquid soap
15 lbs. silicate of soda.

Goods are washed or wet out, run at 120 deg. F. three hours, rinsed twice, extracted and dried. (5052)

Under normal conditions the recipe you are now using should not give harsh results as illustrated by sample No. 2. However,

as spun silk is reworked and recombed silk, there is the probability that the silk was damaged in the reworking, or it may even have been bleached stock previous to reworking. By subjecting to still another bleach the silk fibre is overbleached, in which case it will become harsh and of a yellowish-brown coloration. The same applies to stock damaged by alkalies. By explaining to the manufacturers of this material, they may be able to give you stock that has not previously been bleached.

It is more probable that your trouble is due to an insufficient rinsing after bleaching. A small quantity of silicate of soda dried in the fabric will also give the results you complain of. It would be advisable to give three rinses instead of two; the first at about 120 deg. F. and the next two at about 100 deg. F. It is very essential that the fabric be clear of all soap and alkalies; also the soap used should be a neutral one. When preparing your bleach liquor add the silicate of soda first, the albone second, and the soap last.

Mohair Top and Roving

I am sending you a sample of mohair roving, also a sample of the top from which it is made. The roving should weigh 4½ drams. Will you kindly give me your opinion as to the evenness and twist and state whether in your opinion it is too hard or soft. Do you think it will spin to 1/30s and make a good spin? (5081)

The mohair top is a very nice one and the quality is good and should spin to 1/30s all right, making a good spin if it is handled well. The roving twist for spinning is on the hard side. It should be on the soft side because it will harden up some itself. The roving is good in the matter of being even. With proper ratching and twists you should have no trouble running this mohair top to counts.

Layout for Flannel Shirting

Will you kindly mail me advice on the following: A small sample of cloth has been sent me for a pattern for an 8 oz. worsted flannel shirting. The sample sent was evidently made from about a 2/50s worsted warp and filling. They wish me to make same with a 2/25s warp and filling to weigh 8 oz. finished. Having never made anything of the kind would like your advice on the matter. Have figured this to take approx-

imately 1950 ends in warp, 63 inches in reed, and 28 picks, and require no fulling, but it seems to me this would make rather a coarse looking slazy fabric. Will appreciate very much a layout for this cloth. (5051)

With the layout as given above, we figure that the loom weight will be only 8.84 ozs. per yard. Calculating the usual allowance of 15% for loss in scouring clean the finished weight will be approximately 7½ ozs. per yard.

We would advise as follows: Have the warp yarn twisted only hard enough to weave well, and the filling yarn comparatively soft. Dress a sample warp, say 5 yds. long; weave one part regular three-leaf twill, 1 up, 2 down, filling face; and another part regular plain weave, 1 up, 1 down. Accept the part that looks best after finishing. You could also weave a common four-leaf twill part on the same warp, by drawing the warp straight across 12 harnesses.

Finishing Mercerized Half Hose

We are mailing you herewith a sample of 176 needle mercerized half hose. We admire the finish on this sample with its bright, glossy bloom, and would be much obliged if you will advise us how this may be obtained. What is the best kind of dye to use for this class of work; that is, mercerized hose, so as to retain or improve the effect of the processing. (4970)

The best class of dye for this work resolves itself into narrow limits. Undoubtedly the best method of producing a bright, clear black, subject to such shading as the dyer may require to meet the usual changes of fashion, is with the diazotized and developed blacks. These blacks are dyed in the same manner as the ordinary direct dyes, with the aid of common salt in the dyebath.

After dyeing, the stockings are washed and passed through a cold bath charged with nitrate of soda and acidulated with muriatic acid. After this second treatment, the stockings are immersed in the developing bath, which is prepared with either beta naphthol, paraphenylenediamine, or metatoluenediamine. These are the most important "developers" for blacks, but there are others, besdes mixtures intended for the production of compound or intermediate shades. Blacks produced in this manner are of excellent quality, and when well washed after dyeing are of excellent fastness and brilliancy.

This method of dyeing naturally costs more than when only direct dyes are used, followed with a "fixing" in a bath of formaldehyde. This latter method produces a good black if the black dye is good and strong, but is not comparable to the developed black. Whatever method of dyeing and softening is used, pressing always adds to the appearance of the goods, and aids in selling.

Long and Short Butt Needles

In a cylinder of, say 200 needles, there are 100 long butts and 100 short butts. We would like to hear from you as to the methods that are used by some of the mills so that the 100 needle of each may be kept the same in the cylinder without getting uneven. We have had trouble along this line and wish to check up on what other people are doing. We would thank you for any information you may give us. (5075)

In several mills where the writer has been employed we have marked either the stationary sinker ring with a prick punch or ground a little mark on the cylinder walls, where it could be most conveniently seen, to mark the division between the long and short butt needles. We have found this to be a great time saver besides helping to make more accurate work.

A mill man describes his method as follows: The method by which both the knitter and the fixer can readily determine the dividing point is by grinding a small portion off the two sinkers dividing the long and short butt needles. There are other methods such as prick punching the cylinder but we believe the above is the simplest and best method.

Rolls for Felt Washers

We operate endless felt washers. The rolls have been zinc plated, but this did not stand up very well and when it wears off due to the action of the soap and friction of the goods the cast iron surface is exposed and the goods are subject to rust spots. We have been advised that copper plating is the best thing to do. We are wondering if you know of any special paint or enamel treatment which could be applied periodically which would give the results wanted without chipping or flaking. (5076)

We know of no paint or enamel that will stand the continued action of soap, pressure and friction to which these rolls are subjected. Even if they were insoluble in soapy water, no

paint or enamel has the hardness to resist wear like a metal will. If it is necessary or desirable to make these rolls of cast iron a heavy copper or nickel plate would be better than zinc, but as the plate on any surface is only a few thousandths thick this will also wear through. For a permanent job we would make these rolls of monel metal, hard bronze, cast iron with a vulcanized rubber surface, or wood, any one of which would be better than plating on a cast roll. Wood is generally used for rolls in most washing machines, but rubber or monel metal would be more lasting.

Better White on Wool Underwear

We are manufacturing a line of 50% and 100% wool underwear, part of which is made up in white. In our washing and fulling process we are using a mixture of soap and soda ash. We would like a white, clear finish to improve the appearance of these goods and wish to inquire if you can advise us of any material which will aid us in getting this. (5040)

A finishing bath of sodium perborate and then a slight blueing will give a clearer and whiter appearance to your goods than you can obtain from the use of soap and soda ash alone. The process is as follows:

Scour or full your goods with soap and soda ash as you are now doing. When finished rinse well with warm water and when clean fill your machine about one-third full of warm water. Add a small amount of ammonia and then add slowly 2% on the weight of your goods of sodium perborate. Run in this bath for at least ten minutes, then rinse well with first warm and then cold water. A little bluing added to the last cold water rinse will improve the whiteness of the goods, but this is not absolutely necessary.

An underwear mill man replies as follows: From the above question I draw that you want a clean creamy white appearance or finish on your underwear fabric such as most underwear manufacturers desire. You do not state whether you bleach your goods or not but from the way the question reads I assume that you do not.

In washing or scouring 50% or 100% wool underwear fabrics, it would be desirable to add a little ammonia to your scouring bath. You do not state the proportion of soap and soda ash you use, but in general practice you can afford to add more soda ash in your fulling process in handling the 50% wool fabric than you do in handling the 100% grade.

If you are desirous to get a good white without bleaching, it would be advisable to add 1 to 2% of soluble oil. This material would help clean the fabric as well as softening it.

Many manufacturers of underwear are forced to bleach their fabrics and the process mostly used is the peroxide bleach. A semi-bleach is all that is required for woolen underwear as a creamy white is wanted rather than a dead white. The need and extent of bleaching underwear fabric depends on the condition of the gray yearns used.

Finishing Cotton Sheeting

Would you kindly advise me the best way to bleach and finish cotton sheeting with calender finish? (5086)

The better grades of domestic sheeting that are known so well under trade names are practically all bleached by what is known as the lime bleach process, the first boil in the kier being in connection with hydrated lime solution, the second boil with soda ash solution, and the necessary scouring and treatment with chemic or chlorine liquors after the two boils. From here the goods are properly washed, run through a 5-roll water mangle, starched on a 2-roll starch mangle, run on to a short tenter about 30 ft. long, then directly on a 31-cylinder drying machine, conditioned by a conditioning machine, or atomizer sprinkler, and then go to a 5-roll calender. This 5-roll calender would have either three metal rolls and two cotton rolls, or three cotton rolls and two heating metal rolls, depending on the finish to be obtained. Such a range of machinery would produce a pure finish high-grade sheeting.

Luster on Mohair Cloaking

At present I am making some sixteen ounce cloaking which is 50% mohair and 50% wool. It is necessary for me to obtain more luster but it seems almost impossible to do so with the machinery that I have to work with. These goods are fulled for 2 hours, washed thoroughly, napped wet, dried, then finish napping dry. Then the goods are sheared and steam brushed. We have one single acting napper, shear and brush which I use for steaming. I believe the only way to improve the luster is by having an up and down wet brush, or in other words a teasel gig, which I have used for this purpose in other mills. Goods are stock dyed fancy colors for which it would be im-

possible to use a steamer. Would appreciate it very much if you would give me any information possible on this matter. (5056)

It seems to us that you would obtain more luster by using a percentage of stronger fibered mohair, say as much as can be used without seriously affecting the spinning and the good weaving of the yarn, or this might be used only for filling yarn, keeping the warp yarn as it is. We advise you to extract the pieces well after washing and nap them well in the damp state. The action of a teasel gig is not vigorous enough for these goods. A double acting napping machine will do all the work needed. Be careful not to overdo the dry napping which might strip the nap from the fabric. Have the shear brushes in good working order and shear only to square the nap. For the final process condition on a cooling and conditioning machine.

Repairing Kier

Please advise if you know of any composition which we can use for repairing an old cast iron boiling-out kier, the bottom of which has become rusted out in holes. The sides of this kier are intact as yet, but the cast iron bottom, which is about 1 in. thick has become pitted, due to long chemical action. The composition would have to stand a boiling temperature as well as the chemical action. If you know of anything of this nature, kindly advise us. (5033)

The inquirer does not state how extensive the pitting action is, whether it is general all over the head or only in spots. It would be interesting also to know the szie of the holes that are eaten through the head. Another thing that should be known is whether the kier operates under pressure, and if so how much pressure.

If the kier in operation is open to the atmosphere, that is, if there is no pressure inside, and if the pitting is not too general, it might be repaired by filling up the pits and holes with No. 2 "Smooth-On" iron cement. One part of water by bulk should be mixed with four parts of the cement to the consistency of a thick putty, which should be pounded or forced into the pits and holes. Two or three hours after it has been applied it should be moistened with water to facilitate hardening.

If pressure is used in the kier the "Smooth-On" treatment will probably not answer. It might be possible to fill in the

pits and holes by the oxygen-actylene welding process, or even by electric welding. Of course if the action is general all over the head, either of the above methods would probably be out of the question. In case either the "Smooth-On" or the welding is tried, the metal where the treatment is applied must be thoroughly cleaned of all rust and scale in order to give a bright fresh surface to which the cement or the metal can adhere.

If the action is general all over the head, possibly pieces of boiler plate fitted and shaped could be bolted or riveted to the cast iron head, the joints and round the bolts being made tight by the use of "Smooth-On." One concern used to have the inside of boiling-out kiers washed over every three months with lime and water, not whitewash. This served to prevent corrosion and also helped to eliminate iron stains. Other bleachers find this unnecessary, as the action of the alkali in the liquor serves to glaze the inside of the kier, which in itself stops both corrosion and staining.

Doup for Leno Cloth

I am enclosing a sample of leno cloth with a 2/2 turn, and would like to ask can this pattern be made on a steel doup. We have particulars for it to be made on a twine doup, but as the steel doup is much more satisfactory than the twine we would like to make it on the steel doup if possible.

(5042)

The leno sample submitted is what is termed a two cross two leno, and it cannot be woven with the flat steel doup heddle. A worsted or silk braided doup must be used for the following reasons: When the plain or ground part of the cloth is being woven, the two ends that form the doup ends and the two ends that form the ground ends must work as separate ends, and not as doubles. This can only be done by the use of the worsted or silk braided doup because this type of doup is open top to bottom when operating on the open shed, which permits the two ends that are in the doup to separate, and weaving alternately up and down they form a plain shed. The two ground ends that are used as crossing ends do the same thing when the plain shed is being woven.

When the leno weave commences the two ends forming the doup ends and the two ends forming the ground ends work as doubles and cross each other, hence the reason why this type of leno is termed a two cross two leno.

The flat steel doup heddle will not permit the separating of the two doup ends because this type of doup is not open like the worsted doup. The flat steel doup has an eye much like the eye in the ordinary heddle and the two doup ends must be drawn in this eye and operate as one end all through the weave, so that it would be impossible to have the plain weave follow the leno weave, as in the sample of cloth submitted.

Finishing Wool Goods

I am enclosing two samples of fabric and desire to know if the finish on the samle marked "A" can be secured on the sample marked "B." I realize that the stock is of a better grade in sample "A," but feel that the soft, unfinished worsted effect can be obtained on sample "B" with the lower grade of stock if it is put through the proper processes. Sample "B" looks flat instead of having the lofty appearance of sample "A." Do you think the fabric is pressed properly? (5027)

We think that a better cover or felt and a loftier feel can be produced on fabric "B" if treated as follows: Nap two runs on the back lightly, then nap the face lightly, say four runs. Next full, trying to get the goods fulled snugly to width in as short a time as possible. Avoid all stretch. When washed and dried put on the shear and run with laying brush off and the raising brush touching only lightly. Drop the shear head until the ledger blade is at least 1/16 inch below rest; this will allow shearing cylinder to come over onto face of goods and cut off fibre without the use of the brushes. This will save the fabric from the gigging done by the brushes when on hard. Press without tension. If possible, give a little steam as it leaves the hot cylinder. This should thicken and take away that thready feel.

Iron Stains on Cloth

We are sending you by parcel post piece of fabric which is stained. This fabric is stained like sample when taken from the kier. We use 3 per cent, solid caustic, 2 per cent. soda ash, and boil 7 hours. The stains can be removed by washing with soap and water. We would ask you to advise what you think these stains are from. (4904)

These brown spots are shown by chemical test to be iron, and are made either by direct contact with rusty iron places in the kier, or by rust being injected into the kier through the

water or steam lines. Careful examination of the kier and all the water and steam connections should be made. In starting up the kier sometimes the first water and steam run in will contain water which has become rusty from lying in the pipes since the last kier boil.

From actual experience the writer would say that these brown spots were caused by rusty water or condensed water from the steam pipe. Observation should also be taken as to whether these spots run through the entire batch in the kier, only on the cloth which lies on the sides of the kier, or at the top or bottom of the kier. These stains can also be removed by passing the cloth through a weak muriatic acid sour bath.

Small Burrs in Wool

Can you tell me of a way to handle my fancies to stop fancy spots. I am running a wool mixed with a fine noil and have to grind quite often to keep my cylinders clean. They spot up quite badly. This is not a case of bent wires and I don't think they are hooked as they run all right on finer work. I have tried more speed and less speed, but that doesn't make any difference. A lot of the spots have burrs in them and when I stop the card and look at them the wire is stuck through the burr. This is a small burr that the picker will not take out. (5045)

The difficulty seems to lie in the fancy being too fine. The fact that there are present in the wool fine burrs that stick into the wire of the cylinder seems to bear out this point. The fancy wires are not stiff enough to raise these burrs from the cylinder wire, which results in their being further embedded into the cylinder by the action of the fancy. We would suggest a 26/30 straight tooth, open set 1¼ in. staple fancy, which will give good results on a large variety of different work.

Finishing Printed Warp Sateen

I am enclosing a small sample of 29 in. warp sateen printed wash goods, and would like it very much if you could give a formula for producing the same finish as sample has; also give the machinery required to handle same. (5032)

The goods after printing have unquestionably been starched through a 2-roll starch mangle and dried over a cylinder drying machine; afterwards tentered on an automatic clip tenter and wound on rolls ready for sprinkling. They are then sprinkled

on a brush or atomizer sprinkler, allowed to stand an hour or two for proper conditioning, and afterwards calendered on a 5-roll calender with three combination or cotton rolls and two heated chilled iron rolls.

The length of tenter, size of dryer, and in fact the general arrangement of the finishing range would depend chiefly on the requirements of the finished width. An important question to be considered is the gray width of the goods, and the width the customer requires the goods completely put up.

The proper size ingredients are about as follows for 100 gallons: 30 lbs. of pearl corn starch and 20 lbs of white corn dextrine with the addition of 10 lbs. of some good softening ingredient such as soluble tallow or 50% turkey red oil, also the proper amount of bleacher's blue or tint to give the correct shade. This is approximate, and would, of course, have to be worked or changed to meet conditions.

Mercerizing Yarn

Please advise best known formula for mercerizing cotton yarn in skeins. (5030)

We are quite sure that there is no "best known formula" for mercerizing cotton yarn, as each mercerizer is governed to a certain extent by his own ideas or by other conditions peculiar to his own plant. The general practice in skein mercerizing is about as follows: Give the yarn a thorough wetting out, preferably by a kier boil, then whiz to get a uniform moisture content and to avoid carrying too much water into the caustic. Load the machine according to the manufacturer's direction and apply stretch according to the yarn. Average yarns are about right if the sides of the stretched skeins can be pressed toward each other by the hand for about half an inch on each side.

Have the caustic from 50 to 56 deg. Tw., kept as cool as convenient. Immerse the yarn for 3½ to 4 minutes. Raise and wring out excess caustic. Wash while still under tension for at least 5 minutes, starting with hot water. So-called extra stretch is put in shortly after washing has begun, in order to take up the slack and help the luster. After most of the caustic is removed, release the tension and transfer the yarn to a sulphuric acid sour bath of 2 or 3 deg. Tw., and after 10 or 20 minutes wash thoroughly and finish as desired.

Menders and Seconds

I would like to know what would be considered good practice with respect to menders and seconds in a well organized efficient mill on the following product: 200 needle cotton half hose, using 14s for the top, 18s for the leg, and 2/40s in the heel and toe. I would like to have the knitting, looping and dyeing separate. (5047)

A knitter replies to this question as follows: As we understand your question you wish to know the percentages of menders and seconds chargeable to these departments in a good mill. We have found in our long experience in several mills a considerable variation due to unavoidable conditions which we could not control. We have found it a paying proposition to have our product inspected in the knitting room. The perfect stockings are bundled by themselves and go directly to the loopers, while menders and seconds are mended at once before the holes are enlarged by handling.

Very many items enter the question as regards the knitting room product, such as quality of yarns, whether the knots are round or square, age of the machines, experience of the operatives and the quality of their training. It takes about three generations to develop a good knitting room operative. Amount of doubling done at transfer, etc. If by menders you mean a single stitch dropped at the transfer, would say up to 2%, and for seconds from 2 to 12%.

We take our loopers from among the oldest and most experienced toppers in the knitting room, consequently we expect perfect looping. The percentage of menders or seconds from a looping department should be negligible. Seconds from the dyeing on account of variations in fibre that will not take the dye evenly and sometimes faulty dyes may amount to from 1 to 3%. We have considered a total of 10% fair and 5% excellent on ordinary cotton hosiery.

Silk Weighting

In TEXTILE WORLD for July 28, 1923, there is an article on "Skein Silk Dyeing" by H. R. Tisdale, which we have read with interest, and about which we should like to ask some questions. In our textile classes we try to give our students a consumer's appreciation of the problems of the manufacturer.

Just now we are studying the problem of silk weighting, and the questions which came up in regard to the article mentioned above are as follows:

(1) Is the tin-phosphate-silicate process the one which mills use most for weighting colored silk?

(2) Do all mills use approximately the same formulas, or are there patents on the processes?

(3) Would the temperature, strength of solution and length of application need to be approximately the same in all mills in order to get satisfactory results?

(4) The author does not mention any preservative after-treatment of the weighted silk with an easily oxidizable substance such as the aldehydes; is it because such treatment is not in general use, or is it that such treatments are secret processes? (5038)

Mr. Tisdale replies to the above questions as follows:

(1) Yes.

(2) Hardly any two mills use exactly the same formulas. The method of weighting silk with tin-phosphate-silicate has been in use for many years.

(3) The temperature, strength of solutions, and time of application should be approximately the same in all mills to get uniform results, but are not necessary to get satisfactory results.

(4) I understand that the use of a substance such as an aldehyde, to preserve weighted silk, is patented.

Rovings for Mock Twists with Different Percentage Mixtures

At present I am making 13s and 14s yarn from 1.76 hank roving with a draft of about 7.38 on 13s and 8 on 14s (single roving). It is necessary for me to make some mock twists and this necessitates double roving of unequal weights. I would like to have figured for me, with 1.76 hank as a base for single roving, what hank rovings I would require to produce a mock twist thread with say

60% black—40% white
65% black—35% white
70% black—30% white

The draft should not exceed 14. The object is to bury the white with the black, making the thread look blacker, showing less white. (5021)

In answering this question it is assumed that the color combinations are to be made by using one strand of 1.76 hank

black roving, with one strand of white roving, the size of which is dependent upon the proportion of black and white desired. This will mean that a different size white roving will be necessary for each of the percentages mentioned; that the equivalent size of this and the black strand will be different for each percentage, and that in consequence of this the draft needed for each of the percentages will be different.

A very simple way of explaining the calculations necessary is to base them upon the weight of 12 yards of roving. This length is employed because it is the usual length used in sizing roving, or because 100 divided by the hank of the roving equals the weight of a 12 yard length. It is also true, of course, that 100 divided by the weight of a 12 yard length, in grains, gives the hank of the roving.

Considering the first percentage, 60% black and 40% white, 1.76 hank roving will be 60% of the weight entering and it is necessary to determine the hank to go with it to be 40% of the sum of the two. 1.76 hank roving weighs $\frac{100}{1.76}$, equalling 56.8 grains per 12 yards. 56.8 grains is 60% of the total and the total is $\frac{100}{60}$ x 56.8, equalling 94.67 grains per 12 yards. The difference between 94.67 and 56.8 is the weight of 12 yards of the white roving.

$$94.67 - 56.8 = 37.87 \text{ grains per 12 yards.}$$

Then 100 divided by 37.87 is the hank of the white roving.

$$\frac{100}{37.87} = 2.64 \text{ hank white roving.}$$

Thus by combining a 1.76 hank black roving and a 2.64 hank white roving, the resultant product will be 60% black and 40% white. The weight of 12 yards of these two strands combined is 94.67 grains and so they are equivalent to $\frac{100}{94.67}$, equalling 1.056 hank roving when entering the back roll together. To make 13s yarn from 1.056 hank roving, the draft will be

$$\frac{13}{1.056} = 12.30 \text{ draft.}$$

To make 14s yarn from 1.056 hank roving the draft will be

$$\frac{14}{1.056} = 13.25 \text{ draft.}$$

This first explanation is built from the very simplest steps and admits of very little chance for error, but is rather longer than the following solution which is just as accurate.

The sizes of rovings are inversely proportional to their weights; that is, the less a roving weighs per yard, the higher the number indicating the hank is. For example, a 1 hank roving weighs 8.33 grains per yard, but a 3 hank roving only weighs one-third of that, or 2.77 grains per yard. This means then if two rovings are to give the color proportions of 60% black and 40% white that the number indicating the hank will be smaller for the 60% than for the 40%. Consequently, we can say, if 1.76 hank roving is to be 60% and some other hank roving (unknown) 40%, that the following proportion will solve for the unknown roving size. (Note that this is an inverse proportion.)

$$1.76 : \text{white roving} = 40 : 60$$

$$40 \times \text{white roving} = 60 \times 1.76$$

$$\text{white roving} = \frac{60 \times 1.76}{40} \text{ or } 2.64 \text{ hank}$$

This solution gives us the sizes of roving to use but not the equivalent size of the two when run in together. The equivalent size may be obtained by going back to the weights of 12 yards of each and the sum of the two, or by another method shown below.

This method is often used to find the resulting counts when plying two yarns not of the same size but is equally applicable if not more accurate for this work. It deals entirely with the hank of the roving. The equivalent hank of two rovings is equal to their product divided by their sum. In this case,

$$\frac{1.76 \times 2.64}{1.76 + 2.64} = \frac{4.6464}{4.40} = 1.056 \text{ hank}$$

Finding the draft to use for 13s and 14s is done exactly as previously explained. For the other percentages of color, the solution would be similar to those just given and the shorter method will give the results desired.

For 65% black and 35% white:

$$1.76 : \text{white roving} = 35 : 65$$

$$35 \times \text{white roving} = 65 \times 1.76$$

$$\text{white roving} = \frac{65 \times 1.76}{35} \text{ or } 3.27 \text{ hank.}$$

Equivalent of 1.76 hank and 3.27 hank

$$\frac{1.76 \times 3.27}{1.76 + 3.27} = \frac{5.7552}{5.03} = 1.144 \text{ hank}$$

$$\frac{13}{1.144} = 11.37, \text{ draft for 13s}$$

$$\frac{14}{1.144} = 12.23, \text{ draft for 14s.}$$

For 70% black and 30% white:

$$1.76 : \text{white roving} = 30 : 70$$

$$30 \times \text{white roving} = 70 \times 1.76$$

$$\text{white roving} = \frac{70 \times 1.76}{30} \text{ or } 4.107 \text{ hank.}$$

Equivalent of 1.76 hank and 4.107 hank

$$\frac{1.76 \times 4.107}{1.76 + 4.107} = \frac{7.22832}{5.867} = 1.232 \text{ hank}$$

$$\frac{13}{1.232} = 10.55, \text{ draft for 13s}$$

$$\frac{14}{1.232} = 11.35, \text{ draft for 14s.}$$

Dyeing Pile Fabric

We are enclosing you a small sample which was cross-dyed. By cross-dyed we mean that the filling was originally dyed red and then the whole thing was dyed taupe. This did not affect the taupe color to any great extent, but when we tried it with the blue (to dye the blue on top of the red) it made a considerable change in the red, turning it a bluish shade of red, or rather a sort of brownish cast. Is there any possible way that we can dye a red that we can cross dye? These are all to be dyed on cotton. (5053)

This is a pile fabric made of cotton, the filling of which is dyed red, while the warp was evidently undyed. As the question stands, the pieces were cross-dyed a taupe shade on the pile, which left the red filling somewhat duller in tone, but still of a reddish cast. In attempting to make cross-dyeings with a blue, the warp and the pile came out probably all right, but the red was changed to a brownish cast. This is to be expected under the circumstances, since the blue dye will color the previously dyed filling, altering the shade according to the bottom color already dyed upon it.

With goods such as shown by the sample, there seems to be no method that will protect the filling color against any other that might be used for cross-dyeing. As a matter of fact, the present case is not strictly cross-dyeing. True cross-dyeing is where one of the sets of threads is of a different fibre from the other, such as wool and cotton, or cotton and silk. Cotton-backed mohair plush is a good type of mixed fabric that is generally cross-dyed. The warp is dyed, say with primuline red, while the mohair pile is dyed in a separate bath with some suitable acid dye that will not affect the dye on the cotton.

We regret being unable to offer any practical suggestion to dye such goods where the warp and filling are both made of the same material, other than to dye each separately the desired shade, and to weave them afterwards.

Fancy Rolls Stock in Wool Carding

I am having trouble with the fancy on a finisher card, 48 by 48 inch. The fancy rolls the stock up on top of the top ring doffer. The fancy fills up with stock when set into the cylinder. The wire on the cylinder is new clothing, No. 33. It runs 73 R.P.M. The fancy clothing is new, No. 32 wire common pitch. It runs 408 R.P.M. now, but acts the same at a faster or slower speed. The fancy is running true. I say the clothing is finer than a 32 wire but that was the number on the clothing when it came. The stock is all wool, for 2⅛ run yarn, and 30% wool, 70% shoddy, good grade, for 1⅛ run yarn. The stripper belt is tight. I would be glad to hear from you. (5037)

The difficulty seems to be in the fancy wire being too fine and running too fast for the grade of stock mentioned. The preferred speed of a fancy for ordinary work is about 20% faster than the points of the wire on the main cylinder. However, there are times when this difference can be varied to good

advantage. It seems that a 26/30 open set straight tooth fancy should give satisfactory results in this case. Do not wind on under too heavy tension; also set onto cylinder lightly.

Stain on Mercerized Yarn Dyed Silver

Enclosed please find a skein of yarn which has been mercerized and dyed silver and which we would like you to examine at the place where we have tied a string. We are anxious to know whether you can tell us what has caused the mark on this skein and whether it occurred in the mercerizing, or in the dyeing, or after it had been dyed. We are anxious to have your reply as soon as possible and would appreicate an early reply by mail. (4949)

This stain has every appearance of being caused after dyeing, and from the character of the light shade as dyed—silver—is likely to be due to contact with some article of dyehouse equipment or another batch of yarn containing an acid which would react on the silver shade. Again, the discolorations may be due to iron stains which they also closely resemble. To reach a definite conclusion, a careful examination of a lot of the undyed yarn is desirable. Caustic soda used for mercerizing frequently contains appreciable traces of iron oxide which becomes attached to the yarn during manipulation. The stain does not appear to be due to any cause traceable directly to dyeing.

Finishing Vellum Cloth

We are herewith enclosing a sample of vellum cloth. We would like to know what kind of machinery we ought to have for finishing this cloth. (5018)

Fabrics like the vellum cloth sample sent are finished on special filling machines. The first run is sometimes accomplished on what is known as a Tommy Dodd or back filling machine, after which the goods are dried over a regular cylinder drying machine. The second run is over what is known as an opaque finishing range, consisting of a special starch mangle with a bottom brass roll engraved with a pin or knurl pattern, this roll being fed by a blanket covered or feeder roll in the starch box and having a top rubber covered cushioned roll. This opaque padder or mangle runs in direct connection with an opaque drying machine of special construction and lays the goods down ready for sprinkling over a special brush sprinkler,

from where they are taken to a heavy friction calender and given a friction finish, the calender operating with its highest degree of friction.

Shiny Streaks in Pongee

We are enclosing a piece of pongee, the filling of which is 2 thread Tussah, 2½ turns. Will you kindly advise us your opinion as to the cause of the shiny streaks. (5031)

The "shiny streaks" are irregular in length across the piece. The picks per inch are the same as on the regular cloth. The thread and twist are the same. These shiny streaks can be made by stretching the filling thread. Silk thread is lustered or made shiny by a process of stretching. Our conclusions are that the shiny or lustrous streaks are due to uneven tension in the shuttle.

Ends Break in Weaving

We have recently gone on a class of goods like sample that is giving me considerable trouble. I will explain. The warp is 1/20s white cotton, 4,400 ends, reed 19½ by 3. The goods are woven on a cam loom, eight harnesses, 2 up, 6 down. Now the No. 1 and 2 harness get very tight and the others very loose, thereby putting the strain of the pull of the warp on No. 1 and 2 harness, causing the threads to break considerably. What could I do to remedy this condition? The warp is all on one beam and there is no chance to use two beams. Am sending you sample that requires 54 picks, but they are not all in on account of warp running bad. (5019)

We are assuming from the figures given that the reed is 19.5 dents per inch and the ends are drawn 3 per dent. The trouble seems to be in the reeding of the single ends, for an eight end repeat of the weave is not a multiple of three ends per dent. This would not affect the weaving to any extent if each end were weaving in as a pattern, but ends are weaving in as groups; that is, there is a group of six ends and a group of two ends, and each of these groups weaves as one end. If reeded three ends per dent there will be a split in the order of reeding and this split will affect the group of two ends and the group of six ends in different places in the reed.

Wherever a single end of one group is drawn in the same dent with the ends of the other group, the pull of one group against the other is too great, and the single end that is sep-

arated from its group cannot bear the strain as well as if it were working in the same dent as its own group. No single end from any group should be allowed to work in the dent with another group.

It would be much better to figure a reed that would permit the ends to be drawn in the following manner: 3 ends in one dent (from group of six ends); another 3 ends in one dent (from group of 6 ends); then 2 ends in one dent (group of 2 ends). This would give 3 dents for one repeat and while this would change the width of the pattern very slightly it would permit of reeding each group so that the group of six ends would be split in threes and the group of two ends would be in a separate dent. This would make for better weaving.

From the figures given, the width of the cloth would be about 66¾ inches and the width of the yarn in the reed would be about 75.18 inches. This means that the cloth contracts about 12.63%. If the yarn is reeded as suggested above there would be an average of 2.66 ends per dent in the reed. A total of 4,400 ends divided by 2.66 ends per dent gives 1,654 dents that would be used for the total width of the cloth. These 1,654 dents divided by 75.18 (width of yarn in the reed) would give 22 dents per inch for the new reed.

It would help this weave if the ends were drawn in as doubles and woven on four harnesses. This could easily be done even on the same side cams that are now being used. It would strengthen the yarn and it is obvious that two ends weaving together would run much better than a single end. If this were done the yarn would have to be drawn as suggested. No matter how the yarn is drawn in the harnesses, as long as the groups work together in the reed, that is, with no single end from one group drawn in the same dent with the ends of the other group, the weaving will be improved. The method of drawing-in would not show on the face of the cloth for the yarn is entirely covered by the filling.

The following is another suggestion and while it would take six harnesses it would not require any difference in the order in which the cams operate: From the group of six, draw three ends as one in one heddle and put in one dent of the reed; then draw the other three ends of this group as one in one heddle and put in one dent of the reed. The group of two ends would then be drawn as one in one heddle and put in one dent of the reed.

We would suggest that the warp yarn be sized well, for the filling is of such a nature that the fibres of the yarn are much disturbed when the pick is being beaten up into the fell of the cloth.

Finishing Serge

Enclosed you will find a piece of serge. This is woven 66 inches wide and is to finish 56 inches. We want a clear finish. Are serges put into a fulling mill? Will you kindly oblige by giving me information on how to finish such fabrics?
(5063)

Worsted serges to be clear finished are now often given a little fulling to soften the construction threads and set them uniformly. But care must be taken to raise no nap that cannot be easily cleared away by a shear. Crabbing is the alternative for fulling to set the fabric.

For the clear finishing of fabrics represented by the sample, presumably to be piece dyed, the following procedure is recommended: Full a little each way, then wash, extract, dry and shear close. Then steam the pieces of goods by running them once through a steaming machine onto a wooden roller. Stand up the pieces on one end until they have cooled off, and then repeat the operation from the reverse end of pieces. After dyeing, rinsing and extracting, have the pieces rolled tightly and evenly on wooden rollers and run through the drying machine from these. Then shear the pieces to straighten the nap. Next perch, and deal with imperfections found. Finally, press and run through a cooling and conditioning machine.

Tests for Oils

Information on the following questions would be appreciated by the writer:

1. What test do you recommend to find the acidity in olive oil?

2. What test do you recommend to prove the lubricating value of machine oils (other than practical). (5005)

1. For determining the acid in olive oil the following method can be used: 10 grams of oil are weighed in a clean glass beaker, and 10 cc. of neutral alcohol are added with constant stirring. Then 1 to 2 cc. of phenolphthalein indicating solution are added. Standard decinormal solution of caustic potash or

soda is then run in slowly from a burette, constantly stirring, until a permanent red color is obtained. As each drop of alkali solution falls into the oil, it produces a pink spot. As long as any acid is in the oil this disappears on stirring. As soon as the acid is neutralized, however, this pink color remains permanent. Each cubic centimeter of alkali solution used is equal to 0.0282 grams of free oleic acid. The result multiplied by ten gives the percentage of the acid in the oil. It is customary in reporting free acid in oils, to report it in terms of oleic acid.

The phenolphthalein test solution can be prepared as follows: 5 grams of phenolphthalein are dissolved in 500 cc. of 50 per cent. alcohol. Since this solution will be slightly acid it must be neutralized by adding 0.01 normal caustic continually until a faint pink color appears. Then just remove the color with a drop or two of 0.01 normal acid.

If it is necessary to distinguish mineral acids from fatty acids in an oil, a solution of methyl orange indicating solution may be used. It is turned pink by mineral acids such as sulphuric acid, but is not affected by fatty acids. Methyl orange indicator can be prepared as follows: Dissolve one gram of methyl orange in distilled water and dilute with one liter.

2. For determining the lubricating value of machine oils there are special types of apparatus used and most engineering colleges and some of the large industrial testing laboratories are equipped for such testing.

Making Silk Stocking More Elastic

We are sending you a stocking made of one end 150 denier artificial silk and one end 20/22 China twisted together. There are complaints on this to the effect that the silk part of the stocking is not elastic enough and we are at a loss to overcome this without knitting looser, which we do not think advisable. We want you to tell us what to do to give this stocking that soft, elastic "feel" which is necessary (5061)

We believe that this hose could be knitted a little looser, although the finishing process mentioned below may give a more elastic result. After the goods are dyed and rinsed, put into a rotary washer in which a 10% solution of olive oil soap has been made up. The temperature of this bath should be 105 to 110 deg. F. The goods should be worked in this bath for 10 to 15 min. The bath liquor should then be allowed to run out, and in the same washer a 2% acetic acid bath should be made

up. This bath should be maintained at 100 deg. F. The goods should be worked for five minutes, then extracted and dried on forms. This process will cause the artificial silk to be more elastic, and give the hose a similar physical property to natural silk.

The writer understands that some mills steep artificial silk hose in 5% aluminum acetate solution, cold, and then extract without rinsing. This method is supposed to give the hose a more lasting finish and improve its wearing qualities.

Silk Filling Slips and Tears

I enclose a sample of cloth made with cotton warp and silk filling, and you can see how the selvage tears in the loom. I use a temple with long roll covered with emery cloth. Can you help me to find a temple or temple roll suitable to use with this. (5011)

It is characteristic of the silk used to slip with a cotton warp, particularly if the picks per inch in the cloth are low. Any strain or rubbing is liable to displace the filling in any part of the cloth. Drawing the fingers lightly across will do this, and with such a low pick as in the sample submitted it requires but little selvage strain to displace the picks.

If it is possible to weave this cloth without the temples we would advise that this be done. We think it can be done, for the warp is strong and the pick low and the use of the temple is only for the purpose of saving the warp on the selvage of the cloth. But if a temple has to be used it is advisable to take out the rollers, remove the steel burrs, and then remove enough of the wood so that when the emery cloth or sand paper is glued on the roller the diameter will be no greater than it was before the sand paper or emery cloth was put on.

If the emery cloth is glued on the old roller without reducing the diameter, the diameter is increased just the thickness of the emery cloth, and when that part of the cloth that is moving through the temple is going over the roll it is liable to touch the top of the temple cover. This will displace the filling. But even if the cloth did clear the temple cover the increased diameter of the roll places too great a strain on the selvage of the cloth and this will displace the picks in the manner shown in the swatch submitted.

The remedy would be to first make a stronger selvage, reeding the ends three per cent instead of two. In place of using the common role, covered with fine emery cloth or fine sandpaper, use rubber temple rolls of the same diameter as the ordinary roll; that is, the diameter of the wooden roll, not considering the steel burrs. This should help a lot, but it is rather a difficult matter to stop this silk from slipping on such low pick goods.

Wool Reclaimed from Tanned Sheepskins

Would you kindly advise what chemicals we can use to strip the brown color from tanner's wool, sample of which we are sending you under separate cover. This wool is reclaimed from tanned sheepskin clippings. The method of reclaiming is the boiling of the stock in a solution of muriatic acid and water. The acid and heat dissolve the leather, leaving the fibre free. As soon as taken from the tanks the stock turns reddish brown and we wish to get it back to the natural color of the wool, sort of a light yellow color. If you could suggest something it would be appreciated. (4998)

The usual method of reclaiming wool from tanned sheep clippings is by boiling in a dilute solution of sulphuric acid. The method noted, using muriatic acid, would seem considerably more expensive. The red color is due to the oxidation of the coloring matter from the hemlock tan. Extensive experiments have been carried out, some of which reduce the color, but leave the wool stock in very much poorer condition. The method of preparation is such that the wool is seriously damaged in the first place, and further treatment does not help it any. A wash with dilute ammonia is about the only practical operation and this does not help very much.

Mercerized Yarn Dyes Unevenly

We have had quite a bit of trouble in dyeing light shades of hosiery. We are usually able to keep the silk uniform but we get several shades in the cotton top as shown by the stockings enclosed. We have used different kinds of cotton from time to time in our department, about four makes altogether, we believe, but the stockings enclosed have all been made of the same cotton as far as we know. The dyer claims that the cotton is different or that something is the matter with the mer-

cerization. We wish that you would give us your opinion. If you require the dyeing formula or any other information we shall be glad to give it to you. (5001)

The trouble is, without doubt, due to a difference in the degree of mercerization of the cotton yearns employed. For such a delicate shade of gray as that shown by the samples submitted, the utmost care should be exercised in the selection of the cotton yarns to be used. Even careful selection will avail but little, unless comparative dyeing tests are made to ascertain just how far the mercerization has been carried. Cotton yarns that have been treated short of full mercerization will not take up from the dye bath direct dyes to the same extent as will fully mercerized cotton. It is this irregularity in mercerization that is the bane of many hosiery dyers at the present time.

Streaks in Silk Stocking

We are sending you herewith a silk stocking. You will note its very streaky appearance. We find these streaks to be unusually bad in brown lots and also in many dark colors. Will you please advise what this is due to. (4990)

A knitter replies to this question as follows: We always have this trouble with our full fashioned hosiery if the goods are allowed to lie around wet for any length of time after they come from the dye house. The creases in the goods always show light when we board them, and being lighter they are for that reason not very noticeable in the light colors. We overcome the trouble entirely by drying the goods at 160 degrees F. if we get ahead of the boarding room, for it costs but little to dampen them again when we are ready to do the boarding.

May we be permitted to call your attention to the slur cock on the legger on which the stocking was knit. It is either improperly ground, as you will be able to determine if you reverse your template, or else it is not set square to the head. It draws more yarn knitting in one direction than it does in the opposite run. We call such fabric washboard knitting. It is usually more noticeable in the small part of the leg above the ankle.

The sole of the foot is somewhat short and can easily be remedied by setting the rocker cam a little deeper. If it shows a tendency to mark the instep you can take a little off the corner of the cam.

Dulling Luster of Rayon

We are at present manufacturing a mixed ribbon composed of pure silk warp with either viscose or tubize artificial silk filling. We find the extremely high luster of both brands very objectionable in certain patterns, but our dyer does not know how to overcome that quality without impairing the winding or weaving. There is one yarn on the market, made in Germany, that has the proper luster, but in the present competitive market the price makes it prohibitive. The manufacturers are more or less silent on the subject so I don't imagine their experiments have been in that direction. Any information you can give me, or any suggestions in an experimental direction to dull the luster that you may offer, will certainly be appreciated. (5259)

Dulling the luster of artificial silk is an unusual procedure. Most users of this product employ it chiefly for the brilliancy of its luster and are concerned only with its preservation. Any substance that might be put upon the ribbon after it has been woven, for the purpose of lessening the luster of the artificial silk, would have a similar influence upon the natural silk, reducing its luster also. If it is the intention to treat the artificial silk as used for filling only, by giving it a sort of size or dressing that will deaden it somewhat, care must be taken that such dressing has no action on the other silk in the finished ribbon. Perhaps a dressing made of some starch or dextrine, softened with wax or soap in suitable proportions, to which could be added a small amount of talc or other similar substance, might serve the purpose, besides adding some weight to the finished ribbon. The matter is largely an experimental one, and a number of trials would have to be made before a result that would be successful from every point of view was obtained. To attempt to reduce the luster of the artificial silk by strictly chemical means would probably result in its destruction. The process suggested is mechanical, and offers no positive injury to the filling yarn.

A consulting chemist replies to this question as follows: This problem requires more or less mill experimentation and I very much hesitate to recommend any process for dulling the luster of the silk in question unless we have some information as to just what the mill requires in the degree of luster. There is a possiblity that this could be accomplished by making

certain changes in their finishing mixtures. However, I am afraid that any drastic action taken might result in impairing the silk.

Piece Work on Hosiery Knitting

In changing a knitter from 200 needle cotton work to 220 needle work of practically the same grade, should there be a change in piece work price. If so, how much? In both cases the girl operates the same type of machine and as many machines as she can keep running. The knitting time of the hose is the same. The only question arising is the difference in time required in placing the top on the transfer. (4992)

A hosiery manufacturer replies to this question as follows: We have found it to our advantage to pay more for fine work than for coarse. We must have both production and quality and we have found it paid us well to put our best operatives on the finer machines. When we change over our machines we have our foreman watch the work carefully to find out what the production is going to be. We then divide the amount a girl could average on the coarser machine for her week's pay by the number of dozen she can make on the finer machine. We realize she must have as much as before as a basis of pay. Then to this we add what we feel we can afford for the purpose of keeping her good will and to make her feel that she was promoted when she was given the finer machines to operate. If we are obliged to change back to coarse work we have a clear understanding with our operatives that the change is only temporary and that we will again give them fine work in the order of their seniority, as soon as market conditions permit.

Softening Stiff Cotton Fabric

I enclose herewith sample of silesia which I cannot use in its present condition owing to its being too stiff. I have tried soaking this for a period of four to five days in lukewarm water to remove this stiffness, but without any results. Can you advise me of any treatment that this fabric could be given so as to render it less stiff and more pliable. (5002)

If the inquirer wishes to remove the starch, making the goods completely soft, we would recommend the use of one of the diamalt products in the manner recommended by the manufact-

urer. On the other hand, if the fabric is simply to be treated to soften it, leaving the thickness and weight of the goods about the same, we would recommend the use of soluble oil, using 2½ to 4% solution with warm water at about 140° F. Sew the goods together and pass them through a two-roll mangle containing the soluble oil solution, and dry. In addition to this the use of a three-roll calender with two combination or cotton rolls and a chilled iron roll not heated might assist in smoothing and mellowing up the goods.

Corrosion of Sprinkler Piping by Whitewash

In spraying overhead with whitewash in one section of our factory we carefully covered the heads of our dry sprinkler system but permitted the pipe lines to receive the full spray. After eleven months we find that the pipe is rapidly rusting and scaling underneath the whitewash. Apparently the lime has attacked the iron and is causing rapid deterioration. Those portions of the lines not sprayed, in the same section, show absolutely no deterioration. We would very much appreciate your advising us of a dilute acid or other liquid that can be used to entirely remove the whitewash preparatory to painting the pipe. Wire brushing or scraping removes a large part but does not get it out entirely. Evidently it will require washing to successfully take it all off. (5010)

The following reply is based on reasoning rather than experience. We believe that the trouble is caused by the common salt that was undoubtedly added to the mixture of lime and water. The salt acts as a binder, and causes the whitewash to adhere better to the surfaces. Lime, or in other words, calcium hydrate, will not itself corrode iron or steel; on the other hand it serves to prevent corrosion, just as does ammonia (ammonium hydrate), barium hydrate, sodium hydrate, etc. Salt, as is well known, is a very active corrosive agent, and causes iron and steel to rust rapidly. The common practice is to mix in about two handfuls of salt to a pail of wash. If salt was not used in this instance then we are at a loss to account for the trouble.

Whitewash should never be used on metal as it will not adhere satisfactorily and it lacks permanency. In the case in question we would remove all whitewash scale that can be removed by using a stiff wire brush and sand paper; then try washing the pipe with hot water. It is possible to remove this by using dilute muriatic acid, but to my mind this treatment

is too severe and should only be used if absolutely necessary. The acid will instantly begin to act on the pipe, and will tend to destroy the mill scale that acts as a protective coating, and which if once removed exposes the fresh metal to new and rapid corrosion.

If acid is used, it should be immediately followed by a wash of milk of lime to neutralize the acid, and this in turn should be followed by a wash with pure water. After all this the pipe should be wiped dry and clean from all scale and dirt, and then be given a priming coat of some paint containing pure linseed oil. Red lead may be used. On this priming coat should be put a second coat of any of the numerous non-corrosive metal paints that are upon the market.

A mechanical superintendent replies as follows: Lime should be a rust preventative. I would be inclined to think the rust was on the pipes before the whitewash was deposited. Sprinkler pipes will frequently sweat, especially after the water has been drawn off in winter. Rust will invariably be present on unpainted pipes. The paint will be set on and as the pipes are scoured will draw off rust blisters. Acids would perhaps do more harm than good. Dilute muriatic may remove the paint, but the pipes would have to be washed in clear water afterwards. Oxalic acid solution will remove rust. The action to take in the above case would be to clean the pipes as well as possible and give a coat of red lead paint. When this is dry put on a finish coat of sprinkler pipe red (or dark vermillion) and this will arrest any rusting action of the pipes. The best method to get the present covering off would be to first scrape the pipe and then use emery cloth where the rust is heavy. It should be noted that if acid fumes are present in this section, a special paint should be used for the final coat.

Short Lengths on Tubes in Twisting

In our cotton yarn mill we have recently installed the system of winding, doubling and twisting, instead of spooling and twisting. Now on the twisters we have pieces of tubes left that will not fill the twister bobbins. We want as few knots as possible. What would you advise as the best possible way to get rid of these pieces? (4995)

If the double yarn on the tube is not over ⅛ in. in thickness, we would put the tube back on any winding spindle of the doubler, using care in piecing the ends up single, and refill the

tube in the usual way. If there is too much yarn left on double tube to allow refilling as above, we would back-wind the tube on to another tube on one spindle of doubling machine, drawing from the tube turning. Care will have to be spent in piecing each end single in this case, as one of the pieced ends slightly longer than the other cannot be taken up and will make a bad spot in the twisted yarn.

One, or as many spindles on the doubler as necessary, could be reserved for this back-winding, and it might be necessary to draw from a live spindle. By this method the pieces could be back-wound making a full size tube without a double knot. If we have read the inquiry correctly, we are quite sure that the above is the best way to handle the pieces referred to.

Laying Out Pattern Warps

In our slashing room we run plain warps (all one color). We expect in the near future to run stripe warps. For example, suppose the pattern on the loom beam is as follows:

12 black
4 green
6 white
4 green
12 black

What is the system used to figure out how to indent the warps for the long chain beaming so that the colors will come up on the slasher in such a form that the operator could lay the pattern in the comb?

Another question I should like to ask is: Suppose my pattern is as follows:

1 red
1 green
1 black

and I had to put 6 ends (2 patterns) in one dent on the slasher. How would I separate these colors when the beam is full so that they would come in correct rotation for the drawing-in hand? (5012)

The example in the first question is not very clear as stated. However, we will try to solve the problem as we see it. The inquirer has given the pattern, or one repeat of the pattern, but has not stated how many times this pattern is to be repeated in the warp. There is a difference in laying out this pattern for the long chain beaming according to the number of repeats that are required in the warp. If there were 60 repeats or pat-

terns in the warp, the total number of ends would be as follows:

24 x 60 = 1440 ends black
8 x 60 = 480 ends green
6 x 60 = 360 ends white

In this case the beams for the slasher would be made up as follows:

3 beams of 480 ends black
1 beam of 480 ends green
1 beam of 360 ends white

Now let us take only about half the number of repeats, or say 30 patterns in this case. Then the total number of ends would be as follows:

24 x 30 = 720 ends black
8 x 30 = 240 ends green
6 x 30 = 180 ends white

The 720 ends of black could be made into two beams of 360 ends each. If we should put the green and black on separate beams, they would be liable to become ridgy and make bad running work for the slashers. Therefore, we should put these two colors on the same beam. The pattern for the beamer would be

4 green
6 white
4 green
—
14 x 30 = 420 ends, total on beam.

Taking up the second question, we do not know of any way that you could get the six ends to come to the drawing-in hand in the order you mention. You might try the following suggestion on your slashers:

0 ——— wire dent in comb
1 — red
1 — green
——— drop-wire
1 — black
1 — red
——— drop-wire
1 — green
1 — black
0 ——— wire dent in comb

Use a fine striking comb, about 36 dents per inch; put two white lease strings in before striking comb, one string between the red and green and another between the green and black. By separating the six ends with two drop-wires they would run on the beam nearly straight; by putting the strings in they would separate each color; and by using a fine striking comb there would not be too many ends in one dent, which should help to keep them straight.

Calendering Elastic Braid

Will you please give me information on calendering elastic braid. I know nothing about the process and would appreciate it if you would tell me just how this work is carried on. Do you believe that the increased amount that is obtained for calendered elastic braid over non-calendered finish justifies buying a calender machine for a mill producing 300 gross of elastic braid per week? (5013)

The term "calendering" in connection with finishing narrow fabrics is very frequently misused. Builders of equipment term the machine known in the narrow fabric trade as a "calender" a narrow fabric finishing machine. This usually consists of a sizing mangle with either 2, 3 or 4 squeeze rolls, rubber covered or brass covered, depending on the class of work to be finished; and the proper number of drying cylinders running in direct connection with the sizing mangle to give the desired finished effect, and drying production.

The simplest machine consists of two rubber squeeze rolls and a copper jacketed size pan underneath, with 6 drying cylinders, standard 23 inch diameter, made from tinned iron; arranged either horizontally or vertically and on a 40 in. basis. Such a machine is suitable for producing the ordinary grades of elastic or lisle webbing in widths up to 1½ in., including suspender fabrics, garter elastics and other narrow fabrics of similar design and construction. It will produce comfortably in 48 hours 600 to 700 gross yards of fabric up to 1½ in. wide. As a matter of fact, we know of concerns producing as high as 1,200 gross yards in 48 hours on fabrics averaging 1½ in. wide.

The inquirer will readily understand that his production is very small and really does not merit the installation of such a machine. Narrow fabric manufacturers state that their goods when finished on such a machine bring a better price and that they are able to control shrinkage, which means better yardage.

Red Spots on Stockings

I am sending one pair of artificial silk stockings which have become spotted with some kind of red coloring matter. This color could not have gotten on the goods in the dye house because the spots were discovered before having been sent to the dyeing department. We are at a loss to understand how these goods could have become spotted unless some of the girls in the looping department used lip stick or rouge and got some on the goods. We thought that possibly you could make a test of these goods and advise us as to what kind of coloring matter this is. (5015)

These stockings are stained with the same kind of coloring matter that is ordinarily used in cosmetics, and the only conclusion is that fine particles of the colored sticks became detached while being handled and fell upon the oil-soaked material. Most dyes as used in dyehouses are not soluble in oils, and consequently would not show the "spread" of the spot that a magnifying glass shows in this instance, due to the oil upon the yarn of which these stockings are knitted.

Stripping Color From Yarn

Kindly advise if you think it feasible to strip the color and bleach white a colored yarn like the enclosed sample? If so, please give the formula necessary to perform this work. (5096)

This yarn has apparently been dyed with indigo. It can be stripped by first immersing the yarn in a solution of 1 lb. 4 oz. bichromate of soda to 1 gal. water, luke warm to aid penetration. This is followed by wringing out well and then working in a bath at 140 deg. F. for one-half to one minute, containing in 10 gal. of water 4¾ lbs, sulphuric acid, 66 Be., and 2 lbs. oxalic acid. After the yarn is white enough wash very thoroughly to remove the slightest traces of acid and chromate.

Rayon and Cotton Yarn Sizes

We occasionally desire to purchase a quantity of artificial silk, and while knowing the correct cotton size, do not know the corresponding number in the artificial silk. Can you send us a table or other data that will give us this information? (5127)

Artificial silk is numbered on the same system as natural silk. In this system a 1 denier silk (in practice there is no silk so fine) would contain a length of 4,464,528 yards per pound. Dividing this by any given denier will show the yards per pound of that denier. Or dividing it by the yards per pound of any yarn will show the denier. For example, if you wish to know the size of artificial silk that is equivalent to a 40s cotton, multiply 40 by 840 (the cotton standard) to get the yards per pound. Dividing 4,464,528 by this yardage gives the artificial silk denier that is equivalent to a 40s cotton. 40 times 840 equals 33600. 4,464,528 divided by 33600 equals 133 denier (approximately).

A comparative table of artificial silk and cotton yarn sizes was issued several years ago by the Sauquoit Silk Manufacturing Co., Philadelphia, Pa. You might write them to find out whether copies are available. Possibly the artificial silk companies have such tables. However, you can easily work out a table for yourself covering the range of yarns you are interested in.

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